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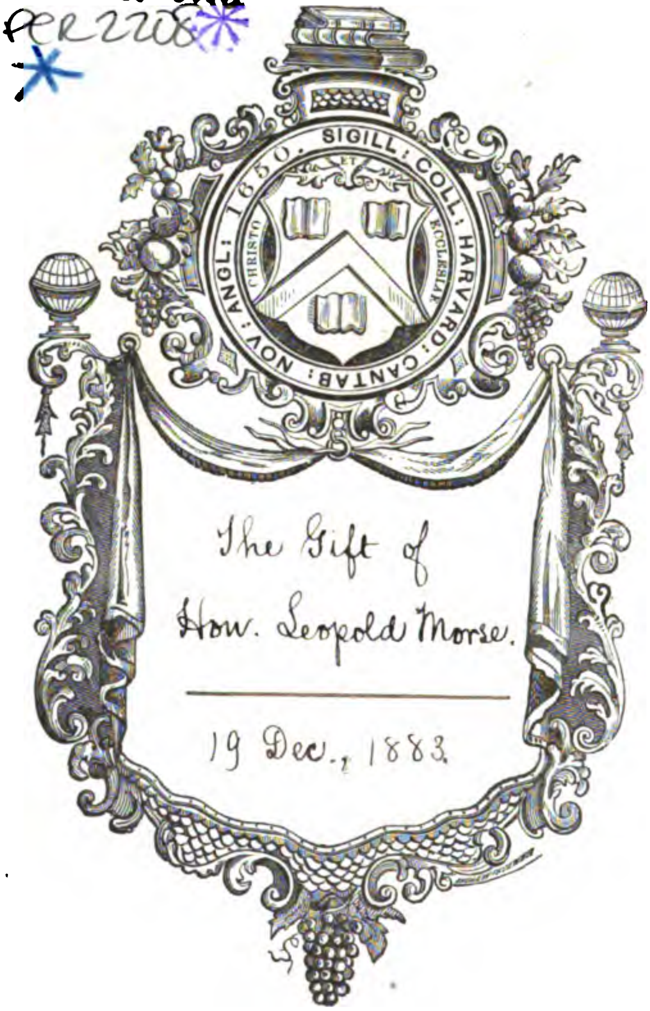
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THE

AMERICAN EPHEMERIS

AND

NAUTICAL ALMANAC

FOR THE YEAR

1886.

FIRST EDITION.

PUBLISHED IN COMPLIANCE WITH A JOINT RESOLUTION OF THE FORTY-SIXTH CONGRESS.

WASHINGTON:
BUREAU OF NAVIGATION,
1883.

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JOINT RESOLUTION

FOR PRINTING THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That there shall be printed annually at the Government Printing Office fifteen hundred copies of the American Ephemeris and Nautical Almanac and of the papers supplementary thereto, of which one hundred shall be for the use of the Senate, four hundred for the House of Representatives, and one thousand for the public service, to be distributed by the Navy Department.

Sec. 2. That additional copies of the Ephemeris and of the Nautical Almanac extracted therefrom may be ordered by the Secretary of the Navy for sale: Provided, That all moneys received from such sale shall be deposited in the Treasury to the credit of the appropriation for public printing.

Approved, February 11, 1880.

PREFACE.

THE contents of the present volume of *The American Ephemeris* are, in general, similar to those of the volume for the preceding year. Beginning with the volume for the year 1882, the arrangement of the work is as follows:—

Part I, *Ephemeris for the Meridian of Greenwich*, gives the positions of the major planets, and other fundamental astronomical data for equidistant intervals of Greenwich mean time.

Part II, *Ephemeris for the Meridian of Washington*, gives the ephemerides of the fixed stars, sun, moon, and major planets for transit over the meridian of Washington. The mean places of the fixed stars and data for their reduction are also included in this Part. The list of mean and apparent places of fixed stars has been greatly enlarged, for the convenience of field-astronomers.

Part III, *Phenomena*, contains predictions of phenomena to be observed, with data for their computation. Washington mean time is used in this part except in a few cases, notably that of eclipses, where Greenwich mean time was judged more convenient. The additions comprise more complete data for eclipses of the sun, diagrams showing the configurations of the satellites of Jupiter, data respecting the disks of Mercury and Venus for the reduction of meridian and photometric observations, and diagrams, with tables, for identifying any known satellites of other planets.

SIMON NEWCOMB,
Professor U. S. Navy, Superintendent.

WASHINGTON, *February*, 1883.

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CORRECTIONS.

EPHEMERIS FOR 1883 (FIRST EDITION).

Page 167,	Oct. 9,	Semidiameter at noon,	*for* $15' 19''.1$	*read* $15' 19''.9$
293,	σ Andromedæ,	Declination,	" $+35°$	" $+36°$
295,	ζ Geminorum,	Right Ascension,	" $10^s.454$	" $10^s.184$
	Annual variation in	Right Ascension,	" $+3.6527$	" $+3.5627$
297,	ξ Hydræ,	Declination,	" $17''.76$	" $37''.76$
299,	δ Aræ,	Declination,	" $65°$	" $60°$
301,	74 Cygni,	Ann. Var. R. A.,	" $7^s.4010$	" $2^s.4010$
301,	δ Sculptoris,	Declination,	" $58°$	" $28°$
380,	Dec. 32,	R. A. of Centre,	" $42^s.14$	" $44^s.14$

465, The conjunctions and elongations of Japetus should read as follows:—

JAPETUS	Superior Conjunction .	Jan. 16	June 29	Sept. 16	Dec. 4
	East Elongation . . .	Feb. 6	July 19	Oct. 6	Dec. 23
	Inferior Conjunction . .	Feb. 26	Aug. 8	Oct. 26	
	West Elongation . . .	June 9	Aug. 28	Nov. 15	

474,	line three,	*for* $356\frac{1}{4}$	*read* $365\frac{1}{4}$
495,	line nine from bottom,	" $\sin \psi$	" $\cos \psi$
498,	line ten,	" $Q+P$	" $180° - Q - P$
498,	line eleven,	" $Q-P$	" $180° - Q + P$

Ephemeris for 1884 (*First Edition*).

Page 293,	σ Andromedæ,	Declination,	*for* $+35°$	*read* $+36°$
294,	σ Arietis,	Ann. Var. R. A.,	" $+3^s.3057$	" $+3^s.3036$
295,	ζ Geminorum,	Right Ascension,	" $14^s.108$	" $13^s.747$
	Annual variation in	Right Ascension,	" $+3.6527$	" $+3.5627$
297,	ξ Hydræ,	Declination,	" $37''.64$	" $57''.64$
315,	α Cassiopeæ,	Dec. 34.2, Declination,	" $88''.9$	" $98''.9$
339,	η Bootis,	Dec. 34.8, R. A.,	" $11^s.24$	" $12^s.24$

Ephemeris for 1885 (*First Edition*).

Page 249,	last line in last column,	*for* 8 30.7	*read* 8 30.8
325,	22 Camelop. (H.), R. A. opposite Oct. 5.7,	" .74	" .76
	Delete – .07 opposite Dec. 34.5 and move column from Oct. 5.7, inclusive, down one line.		
375,	fifth column,	*for* o^1 Cygni	*read* 31 Cygni
408—409,	Declination of Neptune from Sept. 1 to Dec. 32, both included, to be increased *one* degree.		
417,	Third column, second line, remove E to third line.		
453,	Diagram of Jupiter's Satellites, reverse direction of arrows.		

The American Nautical Almanac for 1886 (*First Edition*).

Page 253,	Eclipse Charts, first line,	*for* August 8—9	*read* August 28—9.
261,	Twenty-third line,	" $21^h\,5^m\,57^s.4$	" $21^h\,6^m\,55^s.06$

CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

THE YEAR 1886, WHICH COMPRISES THE LATTER PART OF THE 110TH AND THE BEGINNING OF THE 111TH YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO—

The year 6599 of the Julian Period;
" 7394–95 of the Byzantine era, the year 7395 commencing on September 1st;
" 5646–47 of the Jewish era, the year 5647 commencing on September 30th, or, more exactly, at sunset on September 29th;
" 2639 since the foundation of Rome, according to Varro;
" 2633 since the beginning of the era of Nabonassar, which has been assigned to Wednesday, the 26th of February of the 3967th year of the Julian Period: corresponding, in the notation of chronologists, to the 747th; and, in the notation of astronomers, to the 746th year before the birth of Christ;
" 2662 of the Olympiads, or the second year of the 666th Olympiad commencing in July, 1886, if we fix the era of the Olympiads at 775½ years before Christ, or near the beginning of July of the year 3938 of the Julian Period;
" 2198 of the Grecian era, or the era of the Seleucidæ;
" 1602 of the era of Diocletian.
" 2546 of the Japanese era and to the 19th year of the period entitled "Meiji."

The year 1304 of the Mohammedan era, or the era of the Hegira, begins on the 30th day of September, 1886.

The first day of January of the year 1886 is the 2,409,908th day since the commencement of the Julian Period.

CHRONOLOGICAL CYCLES.

Dominical Letter	C	**Solar Cycle**	19
Epact	25	**Roman Indiction**	14
Lunar Cycle or Golden Number	6	**Julian Period**	6599

SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, ETC.

☉	**The Sun.**	♂	**Mars.**
☾	**The Moon.**	♃	**Jupiter.**
☿	**Mercury.**	♄	**Saturn.**
♀	**Venus.**	♅	**Uranus.**
⊕	**The Earth.**	♆	**Neptune.**

SIGNS OF THE ZODIAC.

Spring Signs.	1.	♈	**Aries.**	Autumn Signs.	7.	♎	**Libra.**
	2.	♉	**Taurus.**		8.	♏	**Scorpius.**
	3.	♊	**Gemini.**		9.	♐	**Sagittarius**
Summer Signs.	4.	♋	**Cancer.**	Winter Signs.	10.	♑	**Capricornus.**
	5.	♌	**Leo.**		11.	♒	**Aquarius.**
	6.	♍	**Virgo.**		12.	♓	**Pisces.**

ASPECTS.

☌	**Conjunction, or having the same Longitude or Right Ascension.**
□	**Quadrature, or differing 90° in Longitude or Right Ascension.**
☍	**Opposition, or differing 180° in Longitude or Right Ascension.**

ABBREVIATIONS.

☊	**Ascending Node.**	$^{\circ}$	**Degrees.**
☋	**Descending Node.**	$'$	**Minutes of Arc.**
N.	**North.**	$''$	**Seconds of Arc.**
S.	**South.**	^{h}	**Hours.**
E.	**East.**	^{m}	**Minutes of Time.**
W.	**West.**	^{s}	**Seconds of Time.**

PART I.

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF GREENWICH.

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Frid.	1	18 48 8.06	11.041	S. 22 59 24.3	+12.69	16 18.35	71.07	3 52.78	1.180
Sat.	2	18 52 32.89	11.027	22 54 5.8	13.84	16 18.35	71.02	4 20.96	1.168
SUN.	3	18 56 57.37	11.012	22 48 20.0	14.98	16 18.34	70.97	4 48.81	1.153
Mon.	4	19 1 21.46	10.995	22 42 7.0	+16.11	16 18.32	70.92	5 16.27	1.136
Tues.	5	19 5 45.13	10.977	22 35 27.0	17.23	16 18.30	70.86	5 43.30	1.118
Wed.	6	19 10 8.35	10.957	22 28 20.1	18.34	16 18.28	70.80	6 9.89	1.098
Thur.	7	19 14 31.09	10.936	22 20 46.8	+19.44	16 18.25	70.73	6 35.99	1.077
Frid.	8	19 18 53.30	10.914	22 12 47.1	20.53	16 18.22	70.66	7 1.59	1.055
Sat.	9	19 23 14.97	10.891	22 4 21.2	21.61	16 18.19	70.59	7 26.63	1.032
SUN.	10	19 27 36.06	10.867	21 55 29.4	+22.69	16 18.15	70.51	7 51.11	1.008
Mon.	11	19 31 56.56	10.841	21 46 12.0	23.75	16 18.11	70.43	8 14.99	0.982
Tues.	12	19 36 16.44	10.815	21 36 29.4	24.80	16 18.06	70.35	8 38.25	0.956
Wed.	13	19 40 35.67	10.788	21 26 21.7	+25.84	16 18.00	70.27	9 0.86	0.929
Thur.	14	19 44 54.23	10.760	21 15 49.2	26.86	16 17.94	70.18	9 22.80	0.901
Frid.	15	19 49 12.11	10.731	21 4 52.2	27.87	16 17.88	70.09	9 44.06	0.872
Sat.	16	19 53 29.29	10.701	20 53 31.0	+28.87	16 17.81	69.99	10 4.63	0.843
SUN.	17	19 57 45.75	10.671	20 41 46.0	29.86	16 17.74	69.89	10 24.49	0.813
Mon.	18	20 2 1.48	10.640	20 29 37.6	30.83	16 17.66	69.79	10 43.61	0.782
Tues.	19	20 6 16.47	10.609	20 17 6.0	+31.79	16 17.57	69.69	11 1.99	0.751
Wed.	20	20 10 30.71	10.577	20 4 11.4	32.74	16 17.48	69.59	11 19.62	0.719
Thur.	21	20 14 44.18	10.546	19 50 54.2	33.67	16 17.38	69.48	11 36.50	0.688
Frid.	22	20 18 56.89	10.514	19 37 15.0	+34.59	16 17.28	69.37	11 52.61	0.656
Sat.	23	20 23 8.84	10.482	19 23 14.0	35.49	16 17.17	69.26	12 7.95	0.624
SUN.	24	20 27 20.00	10.450	19 8 51.5	36.38	16 17.05	69.15	12 22.52	0.592
Mon.	25	20 31 30.38	10.417	18 54 7.8	+37.25	16 16.93	69.04	12 36.32	0.560
Tues.	26	20 35 39.99	10.384	18 39 3.5	38.10	16 16.80	68.93	12 49.34	0.527
Wed.	27	20 39 48.81	10.351	18 23 38.8	38.94	16 16.67	68.82	13 1.56	0.494
Thur.	28	20 43 56.82	10.318	18 7 54.0	+39.76	16 16.53	68.70	13 12.98	0.461
Frid.	29	20 48 4.03	10.285	17 51 49.8	40.57	16 16.39	68.59	13 23.60	0.428
Sat.	30	20 52 10.44	10.251	17 35 26.4	41.36	16 16.24	68.47	13 33.43	0.394
SUN.	31	20 56 16.05	10.217	17 18 44.3	42.13	16 16.09	68.36	13 42.46	0.360
Mon.	32	21 0 20.85	10.183	S. 17 1 43.8	+42.89	16 15.94	68.24	13 50.68	0.326

Note.—The mean time of semidiameter passing may be found by subtracting 0s.19 from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Frid.	1	18 48 7.35	11.037	S. 22 59 25.1	+12.68	3 52.70	1.180	18 44 14.65
Sat.	2	18 52 32.09	11.024	22 54 6.8	13.83	4 20.88	1.168	18 48 11.21
SUN.	3	18 56 56.48	11.009	22 48 21.2	14.97	4 48.72	1.153	18 52 7.76
Mon.	4	19 1 20.49	10.992	22 42 8.4	+16.10	5 16.17	1.136	18 56 4.32
Tues.	5	19 5 44.08	10.974	22 35 28.6	17.22	5 43.20	1.118	19 0 0.88
Wed.	6	19 10 7.22	10.954	22 28 22.0	18.33	6 9.78	1.098	19 3 57.44
Thur.	7	19 14 29.88	10.933	22 20 48.9	+19.43	6 35.88	1.077	19 7 54.00
Frid.	8	19 18 52.02	10.911	22 12 49.5	20.52	7 1.47	1.055	19 11 50.55
Sat.	9	19 23 13.62	10.888	22 4 23.9	21.60	7 26.51	1.032	19 15 47.11
SUN.	10	19 27 34.64	10.864	21 55 32.4	+22.68	7 50.98	1.008	19 19 43.66
Mon.	11	19 31 55.07	10.838	21 46 15.3	23.74	8 14.85	0.982	19 23 40.22
Tues.	12	19 36 14.88	10.812	21 36 33.0	24.79	8 38.11	0.956	19 27 36.77
Wed.	13	19 40 34.05	10.785	21 26 25.6	+25.83	9 0.72	0.929	19 31 33.33
Thur.	14	19 44 52.55	10.757	21 15 53.4	26.85	9 22.66	0.901	19 35 29.89
Frid.	15	19 49 10.37	10.728	21 4 56.7	27.86	9 43.92	0.872	19 39 26.45
Sat.	16	19 53 27.49	10.699	20 53 35.9	+28.86	10 4.49	0.843	19 43 23.00
SUN.	17	19 57 43.90	10.669	20 41 51.2	29.85	10 24.35	0.813	19 47 19.56
Mon.	18	20 1 59.58	10.638	20 29 43.1	30.82	10 43.47	0.782	19 51 16.11
Tues.	19	20 6 14.52	10.607	20 17 11.8	+31.78	11 1.85	0.751	19 55 12.67
Wed.	20	20 10 28.71	10.575	20 4 17.5	32.73	11 19.48	0.719	19 59 9.22
Thur.	21	20 14 42.14	10.544	19 51 0.7	33.66	11 36.36	0.688	20 3 5.78
Frid.	22	20 18 54.81	10.512	19 37 21.8	+34.58	11 52.48	0.656	20 7 2.33
Sat.	23	20 23 6.72	10.480	19 23 21.1	35.48	12 7.83	0.624	20 10 58.89
SUN.	24	20 27 17.85	10.448	19 8 58.9	36.37	12 22.40	0.592	20 14 55.45
Mon.	25	20 31 28.20	10.416	18 54 15.6	+37.24	12 36.20	0.560	20 18 52.01
Tues.	26	20 35 37.78	10.383	18 39 11.6	38.09	12 49.22	0.527	20 22 48.56
Wed.	27	20 39 46.57	10.350	18 23 47.2	38.93	13 1.45	0.494	20 26 45.12
Thur.	28	20 43 54.55	10.317	18 8 2.8	+39.75	13 12.88	0.461	20 30 41.67
Frid.	29	20 48 1.74	10.284	17 51 58.9	40.56	13 23.51	0.428	20 34 38.23
Sat.	30	20 52 8.13	10.250	17 35 35.8	41.35	13 33.35	0.394	20 38 34.78
SUN.	31	20 56 13.72	10.216	17 18 54.0	42.12	13 42.38	0.360	20 42 31.34
Mon.	32	21 0 18.50	10.182	S. 17 1 53.8	+42.88	13 50.61	0.326	20 46 27.89

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour,
+ $9^{s}.8565$
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	THE SUN'S Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	1	281 4 5.6	4 8.1	152.94	+ 0.09	9.9926792	+ 1.1	5 14 53.62
2	2	282 5 16.3	5 18.6	152.94	0.13	9.9926827	1.8	5 10 57.71
3	3	283 6 27.1	6 29.2	152.94	0.14	9.9926879	2.5	5 7 1.80
4	4	284 7 38.0	7 40.0	152.95	0.12	9.9926948	+ 3.2	5 3 5.89
5	5	285 8 48.8	8 50.7	152.95	+ 0.07	9.9927034	3.9	4 59 9.98
6	6	286 9 59.5	10 1.2	152.94	0.00	9.9927137	4.6	4 55 14.07
7	7	287 11 9.9	11 11.4	152.93	− 0.09	9.9927257	+ 5.3	4 51 18.16
8	8	288 12 19.9	12 21.2	152.91	0.21	9.9927393	6.0	4 47 22.24
9	9	289 13 29.4	13 30.6	152.89	0.34	9.9927547	6.8	4 43 26.33
10	10	290 14 38.4	14 39.5	152.86	0.47	9.9927719	+ 7.6	4 39 30.42
11	11	291 15 46.8	15 47.8	152.84	0.60	9.9927910	8.4	4 35 34.51
12	12	292 16 54.6	16 55.3	152.81	0.73	9.9928121	9.2	4 31 38.60
13	13	293 18 1.6	18 2.1	152.78	0.84	9.9928354	+ 10.1	4 27 42.69
14	14	294 19 7.8	19 8.2	152.74	0.93	9.9928610	11.1	4 23 46.78
15	15	295 20 13.3	20 13.6	152.71	0.99	9.9928890	12.1	4 19 50.87
16	16	296 21 18.1	21 18.2	152.68	1.02	9.9929195	+ 13.2	4 15 54.96
17	17	297 22 22.0	22 21.9	152.65	1.02	9.9929526	14.3	4 11 59.05
18	18	298 23 25.1	23 24.9	152.61	0.99	9.9929885	15.5	4 8 3.14
19	19	299 24 27.4	24 27.1	152.58	0.93	9.9930270	+ 16.6	4 4 7.23
20	20	300 25 29.0	25 28.6	152.55	0.85	9.9930682	17.7	4 0 11.32
21	21	301 26 30.0	26 29.4	152.52	0.75	9.9931121	18.8	3 56 15.41
22	22	302 27 30.3	27 29.5	152.50	0.63	9.9931587	+ 20.0	3 52 19.50
23	23	303 28 29.9	28 29.0	152.47	0.50	9.9932080	21.2	3 48 23.59
24	24	304 29 28.9	29 27.9	152.44	0.36	9.9932599	22.2	3 44 27.68
25	25	305 30 27.3	30 26.2	152.41	0.23	9.9933142	+ 23.1	3 40 31.76
26	26	306 31 25.1	31 23.8	152.39	0.11	9.9933708	24.0	3 36 35.85
27	27	307 32 22.2	32 20.7	152.36	− 0.01	9.9934295	24.9	3 32 39.94
28	28	308 33 18.6	33 17.0	152.33	+ 0.07	9.9934902	+ 25.7	3 28 44.03
29	29	309 34 14.3	34 12.6	152.30	0.13	9.9935528	26.5	3 24 48.11
30	30	310 35 9.3	35 7.5	152.27	0.15	9.9936172	27.2	3 20 52.20
31	31	311 36 3.5	36 1.5	152.24	0.14	9.9936832	27.8	3 16 56.30
32	32	312 36 56.7	36 54.6	152.20	+ 0.10	9.9937507	+ 28.4	3 13 0.40

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0ᵈ.0.

Diff. for 1 Hour, — 9ˢ.8296. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 7.3	15 3.5	55 22.8	−1.19	55 9.1	−1.09	21 47.3	2.02	25.9
2	15 0.1	14 57.1	54 56.6	0.99	54 45.3	0.89	22 35.8	2.02	26.9
3	14 54.3	14 51.9	54 35.3	0.80	54 26.3	0.70	23 24.2	2.01	27.9
4	14 49.8	14 47.9	54 18.5	−0.60	54 11.8	−0.51	☌		28.9
5	14 46.4	14 45.3	54 6.3	0.41	54 2.0	0.31	0 12.1	1.98	0.2
6	14 44.4	14 43.9	53 58.9	−0.20	53 57.1	−0.09	0 59.1	1.93	1.2
7	14 43.8	14 44.1	53 56.7	+0.03	53 57.8	+0.16	1 44.9	1.88	2.2
8	14 44.9	14 46.1	54 0.5	0.30	54 5.0	0.45	2 29.6	1.84	3.2
9	14 47.8	14 50.1	54 11.3	0.61	54 19.6	0.78	3 13.3	1.81	4.2
10	14 52.9	14 56.2	54 29.9	+0.95	54 42.3	+1.13	3 56.5	1.80	5.2
11	15 0.2	15 4.8	54 57.0	1.32	55 13.9	1.50	4 39.9	1.82	6.2
12	15 10.0	15 15.8	55 33.0	1.68	55 54.3	1.86	5 24.1	1.87	7.2
13	15 22.2	15 29.0	56 17.6	+2.02	56 42.8	+2.17	6 10.0	1.96	8.2
14	15 36.4	15 44.0	57 9.7	2.30	57 37.9	2.39	6 58.4	2.08	9.2
15	15 52.0	16 0.0	58 7.0	2.44	58 36.5	2.45	7 50.1	2.23	10.2
16	16 8.0	16 15.7	59 5.7	+2.40	59 34.1	+2.30	8 45.5	2.39	11.2
17	16 23.0	16 29.7	60 0.9	2.14	60 25.4	1.91	9 44.5	2.52	12.2
18	16 35.5	16 40.3	60 46.8	1.63	61 4.4	1.28	10 45.9	2.59	13.2
19	16 43.8	16 46.1	61 17.5	+0.90	61 25.9	+0.48	11 48.3	2.59	14.2
20	16 47.0	16 46.4	61 29.1	+0.05	61 27.0	−0.39	12 49.7	2.52	15.2
21	16 44.4	16 41.2	61 19.7	−0.80	61 7.7	1.19	13 48.8	2.40	16.2
22	16 36.7	16 31.1	60 51.2	−1.53	60 30.9	−1.82	14 45.1	2.28	17.2
23	16 24.8	16 17.8	60 7.6	2.05	59 41.8	2.21	15 38.6	2.18	18.2
24	16 10.3	16 2.6	59 14.5	2.32	58 46.2	2.37	16 29.8	2.10	19.2
25	15 54.9	15 47.2	58 17.6	−2.37	57 49.3	−2.33	17 19.5	2.04	20.2
26	15 39.7	15 32.5	57 21.8	2.25	56 55.4	2.14	18 8.3	2.02	21.2
27	15 25.7	15 19.4	56 30.5	2.01	56 7.3	1.86	18 56.6	2.01	22.2
28	15 13.6	15 8.3	55 46.0	−1.69	55 26.7	−1.53	19 44.9	2.01	23.2
29	15 3.6	14 59.4	55 9.3	1.37	54 53.9	1.20	20 33.2	2.00	24.2
30	14 55.8	14 52.6	54 40.6	1.03	54 29.1	0.88	21 21.4	1.99	25.2
31	14 50.0	14 47.9	54 19.5	0.73	54 11.6	0.59	22 9.2	1.97	26.2
32	14 46.2	14 44.9	54 5.4	−0.45	54 0.7	−0.33	22 56.3	1.93	27.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 1.					SUNDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 49 2.49	2.1068	S. 15 12 45.8	5.760	0	17 30 39.83	2.1211	S. 18 15 0.2	1.744
1	15 51 8.92	2.1074	15 18 29.1	5.683	1	17 32 47.09	2.1209	18 16 42.2	1.656
2	15 53 15.38	2.1080	15 24 7.8	5.606	2	17 34 54.34	2.1207	18 18 18.9	1.568
3	15 55 21.88	2.1086	15 29 41.8	5.528	3	17 37 1.57	2.1204	18 19 50.3	1.480
4	15 57 28.41	2.1091	15 35 11.2	5.450	4	17 39 8.78	2.1201	18 21 16.5	1.392
5	15 59 34.97	2.1097	15 40 35.8	5.371	5	17 41 15.98	2.1198	18 22 37.4	1.304
6	16 1 41.57	2.1102	15 45 55.7	5.292	6	17 43 23.16	2.1195	18 23 53.0	1.216
7	16 3 48.20	2.1108	15 51 10.9	5.213	7	17 45 30.32	2.1191	18 25 3.3	1.127
8	16 5 54.87	2.1114	15 56 21.3	5.133	8	17 47 37.45	2.1187	18 26 8.3	1.039
9	16 8 1.57	2.1119	16 1 26.9	5.053	9	17 49 44.56	2.1182	18 27 8.0	0.952
10	16 10 8.30	2.1124	16 6 27.7	4.973	10	17 51 51.64	2.1177	18 28 2.5	0.864
11	16 12 15.06	2.1130	16 11 23.7	4.892	11	17 53 58.69	2.1173	18 28 51.7	0.776
12	16 14 21.86	2.1136	16 16 14.8	4.812	12	17 56 5.72	2.1168	18 29 35.6	0.687
13	16 16 28.69	2.1141	16 21 1.1	4.731	13	17 58 12.71	2.1162	18 30 14.2	0.599
14	16 18 35.55	2.1145	16 25 42.5	4.649	14	18 0 19.67	2.1157	18 30 47.5	0.512
15	16 20 42.43	2.1149	16 30 19.0	4.568	15	18 2 26.59	2.1151	18 31 15.6	0.424
16	16 22 49.34	2.1154	16 34 50.6	4.486	16	18 4 33.48	2.1145	18 31 38.4	0.336
17	16 24 56.28	2.1159	16 39 17.3	4.403	17	18 6 40.33	2.1138	18 31 55.9	0.248
18	16 27 3.25	2.1163	16 43 39.0	4.320	18	18 8 47.14	2.1132	18 32 8.1	0.160
19	16 29 10.24	2.1168	16 47 55.7	4.238	19	18 10 53.91	2.1124	18 32 15.1	−0.072
20	16 31 17.26	2.1173	16 52 7.5	4.155	20	18 13 0.63	2.1117	18 32 16.8	+0.016
21	16 33 24.31	2.1177	16 56 14.3	4.071	21	18 15 7.31	2.1109	18 32 13.2	0.103
22	16 35 31.38	2.1180	17 0 16.0	3.987	22	18 17 13.94	2.1101	18 32 4.4	0.190
23	16 37 38.47	2.1184	S. 17 4 12.7	3.903	23	18 19 20.52	2.1093	S. 18 31 50.4	0.277
	SATURDAY 2.					MONDAY 4.			
0	16 39 45.59	2.1188	S. 17 8 4.4	3.819	0	18 21 27.06	2.1085	S. 18 31 31.1	0.365
1	16 41 52.73	2.1192	17 11 51.0	3.734	1	18 23 33.54	2.1076	18 31 6.6	0.452
2	16 43 59.89	2.1194	17 15 32.5	3.650	2	18 25 39.97	2.1067	18 30 36.9	0.539
3	16 46 7.06	2.1197	17 19 9.0	3.566	3	18 27 46.34	2.1057	18 30 1.9	0.626
4	16 48 14.25	2.1200	17 22 40.4	3.480	4	18 29 52.65	2.1047	18 29 21.8	0.712
5	16 50 21.46	2.1202	17 26 6.6	3.394	5	18 31 58.90	2.1037	18 28 36.5	0.798
6	16 52 28.68	2.1205	17 29 27.7	3.309	6	18 34 5.10	2.1027	18 27 46.0	0.885
7	16 54 35.92	2.1207	17 32 43.7	3.223	7	18 36 11.23	2.1017	18 26 50.3	0.971
8	16 56 43.17	2.1209	17 35 54.5	3.138	8	18 38 17.30	2.1006	18 25 49.5	1.057
9	16 58 50.43	2.1211	17 39 0.2	3.052	9	18 40 23.30	2.0994	18 24 43.5	1.142
10	17 0 57.70	2.1212	17 42 0.7	2.965	10	18 42 29.23	2.0983	18 23 32.4	1.228
11	17 3 4.98	2.1214	17 44 56.0	2.879	11	18 44 35.10	2.0972	18 22 16.1	1.314
12	17 5 12.27	2.1216	17 47 46.2	2.793	12	18 46 40.90	2.0960	18 20 54.7	1.399
13	17 7 19.57	2.1217	17 50 31.2	2.706	13	18 48 46.62	2.0948	18 19 28.2	1.484
14	17 9 26.87	2.1217	17 53 10.9	2.618	14	18 50 52.27	2.0936	18 17 56.6	1.568
15	17 11 34.17	2.1217	17 55 45.4	2.532	15	18 52 57.85	2.0923	18 16 20.0	1.652
16	17 13 41.48	2.1218	17 58 14.7	2.445	16	18 55 3.35	2.0910	18 14 38.3	1.737
17	17 15 48.79	2.1218	18 0 38.8	2.357	17	18 57 8.77	2.0897	18 12 51.6	1.821
18	17 17 56.09	2.1217	18 2 57.6	2.270	18	18 59 14.12	2.0884	18 10 59.8	1.905
19	17 20 3.39	2.1217	18 5 11.2	2.182	19	19 1 19.38	2.0870	18 9 3.0	1.988
20	17 22 10.69	2.1217	18 7 19.5	2.095	20	19 3 24.56	2.0857	18 7 1.2	2.072
21	17 24 17.99	2.1216	18 9 22.6	2.007	21	19 5 29.66	2.0843	18 4 54.4	2.155
22	17 26 25.28	2.1214	18 11 20.4	1.919	22	19 7 34.67	2.0828	18 2 42.6	2.237
23	17 28 32.56	2.1212	18 13 12.9	1.832	23	19 9 39.60	2.0814	18 0 25.9	2.319
24	17 30 39.83	2.1211	S. 18 15 0.2	1.744	24	19 11 44.44	2.0799	S. 17 58 4.3	2.402

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 11 44.44	2.0799	S. 17 58 4.3	2.402
1	19 13 49.19	2.0784	17 55 37.7	2.484
2	19 15 53.85	2.0769	17 53 6.2	2.565
3	19 17 58.42	2.0753	17 50 29.9	2.646
4	19 20 2.89	2.0738	17 47 48.7	2.727
5	19 22 7.27	2.0723	17 45 2.6	2.808
6	19 24 11.56	2.0707	17 42 11.7	2.888
7	19 26 15.75	2.0690	17 39 16.0	2.968
8	19 28 19.84	2.0674	17 36 15.5	3.048
9	19 30 23.84	2.0658	17 33 10.2	3.127
10	19 32 27.74	2.0642	17 30 0.2	3.207
11	19 34 31.54	2.0625	17 26 45.4	3.286
12	19 36 35.24	2.0608	17 23 25.9	3.364
13	19 38 38.84	2.0591	17 20 1.7	3.442
14	19 40 42.33	2.0573	17 16 32.9	3.519
15	19 42 45.72	2.0556	17 12 59.4	3.596
16	19 44 49.00	2.0538	17 9 21.3	3.673
17	19 46 52.18	2.0521	17 5 38.6	3.749
18	19 48 55.25	2.0503	17 1 51.4	3.825
19	19 50 58.21	2.0485	16 57 59.6	3.901
20	19 53 1.07	2.0467	16 54 3.3	3.977
21	19 55 3.82	2.0448	16 50 2.4	4.052
22	19 57 6.45	2.0430	16 45 57.0	4.127
23	19 59 8.98	2.0412	S. 16 41 47.2	4.200

WEDNESDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	20 1 11.40	2.0394	S. 16 37 33.0	4.273
1	20 3 13.71	2.0376	16 33 14.4	4.347
2	20 5 15.91	2.0357	16 28 51.4	4.420
3	20 7 17.98	2.0338	16 24 24.0	4.492
4	20 9 19.96	2.0319	16 19 52.3	4.564
5	20 11 21.82	2.0301	16 15 16.3	4.636
6	20 13 23.57	2.0282	16 10 35.9	4.708
7	20 15 25.20	2.0262	16 5 51.3	4.778
8	20 17 26.72	2.0243	16 1 2.5	4.848
9	20 19 28.12	2.0224	15 56 9.5	4.918
10	20 21 29.41	2.0206	15 51 12.3	4.987
11	20 23 30.59	2.0187	15 46 11.0	5.057
12	20 25 31.65	2.0167	15 41 5.5	5.126
13	20 27 32.59	2.0148	15 35 55.9	5.193
14	20 29 33.42	2.0129	15 30 42.3	5.261
15	20 31 34.14	2.0110	15 25 24.6	5.328
16	20 33 34.74	2.0091	15 20 2.9	5.395
17	20 35 35.23	2.0072	15 14 37.2	5.461
18	20 37 35.61	2.0053	15 9 7.6	5.527
19	20 39 35.87	2.0034	15 3 34.0	5.592
20	20 41 36.02	2.0015	14 57 56.5	5.657
21	20 43 36.05	1.9996	14 52 15.1	5.722
22	20 45 35.97	1.9977	14 46 29.9	5.785
23	20 47 35.77	1.9958	14 40 40.9	5.848
24	20 49 35.46	1.9939	S. 14 34 48.1	5.911

THURSDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 49 35.46	1.9939	S. 14 34 48.1	5.911
1	20 51 35.04	1.9921	14 28 51.5	5.974
2	20 53 34.51	1.9902	14 22 51.2	6.036
3	20 55 33.86	1.9883	14 16 47.2	6.097
4	20 57 33.10	1.9864	14 10 39.5	6.158
5	20 59 32.23	1.9846	14 4 28.2	6.219
6	21 1 31.25	1.9827	13 58 13.2	6.280
7	21 3 30.16	1.9809	13 51 54.6	6.339
8	21 5 28.96	1.9791	13 45 32.5	6.397
9	21 7 27.65	1.9773	13 39 6.9	6.456
10	21 9 26.24	1.9756	13 32 37.8	6.514
11	21 11 24.72	1.9738	13 26 5.2	6.572
12	21 13 23.09	1.9720	13 19 29.1	6.630
13	21 15 21.36	1.9702	13 12 49.6	6.686
14	21 17 19.52	1.9685	13 6 6.8	6.742
15	21 19 17.58	1.9668	12 59 20.6	6.797
16	21 21 15.54	1.9651	12 52 31.1	6.852
17	21 23 13.39	1.9633	12 45 38.3	6.907
18	21 25 11.14	1.9617	12 38 42.3	6.961
19	21 27 8.79	1.9600	12 31 43.0	7.015
20	21 29 6.34	1.9584	12 24 40.5	7.068
21	21 31 3.80	1.9568	12 17 34.8	7.121
22	21 33 1.16	1.9552	12 10 26.0	7.173
23	21 34 58.43	1.9537	S. 12 3 14.1	7.224

FRIDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	21 36 55.60	1.9521	S. 11 55 59.1	7.275
1	21 38 52.68	1.9506	11 48 41.1	7.325
2	21 40 49.67	1.9490	11 41 20.1	7.375
3	21 42 46.56	1.9474	11 33 56.1	7.425
4	21 44 43.36	1.9460	11 26 29.1	7.475
5	21 46 40.08	1.9446	11 18 59.1	7.524
6	21 48 36.71	1.9432	11 11 26.2	7.571
7	21 50 33.26	1.9417	11 3 50.5	7.618
8	21 52 29.72	1.9403	10 56 12.0	7.665
9	21 54 26.10	1.9390	10 48 30.7	7.712
10	21 56 22.40	1.9377	10 40 46.6	7.758
11	21 58 18.62	1.9363	10 32 59.8	7.803
12	22 0 14.76	1.9351	10 25 10.2	7.848
13	22 2 10.83	1.9338	10 17 18.0	7.893
14	22 4 6.82	1.9326	10 9 23.1	7.937
15	22 6 2.74	1.9314	10 1 25.6	7.980
16	22 7 58.59	1.9302	9 53 25.5	8.023
17	22 9 54.37	1.9291	9 45 22.8	8.066
18	22 11 50.08	1.9279	9 37 17.6	8.107
19	22 13 45.72	1.9268	9 29 9.9	8.148
20	22 15 41.30	1.9258	9 20 59.8	8.189
21	22 17 36.82	1.9248	9 12 47.2	8.230
22	22 19 32.28	1.9238	9 4 32.2	8.270
23	22 21 27.68	1.9229	8 56 14.8	8.309
24	22 23 23.03	1.9220	S. 8 47 55.1	8.348

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 23 23.03	1.9220	S. 8 47 55.1	8.348
1	22 25 18.32	1.9211	8 39 33.1	8.386
2	22 27 13.56	1.9202	8 31 8.8	8.424
3	22 29 8.75	1.9194	8 22 42.2	8.461
4	22 31 3.89	1.9187	8 14 13.4	8.498
5	22 32 58.99	1.9179	8 5 42.4	8.535
6	22 34 54.04	1.9172	7 57 9.2	8.571
7	22 36 49.05	1.9165	7 48 33.9	8.606
8	22 38 44.02	1.9158	7 39 56.5	8.640
9	22 40 38.95	1.9152	7 31 17.1	8.674
10	22 42 33.85	1.9147	7 22 35.6	8.708
11	22 44 28.71	1.9141	7 13 52.1	8.742
12	22 46 23.54	1.9136	7 5 6.6	8.774
13	22 48 18.34	1.9132	6 56 19.2	8.806
14	22 50 13.12	1.9128	6 47 29.9	8.838
15	22 52 7.88	1.9125	6 38 38.6	8.870
16	22 54 2.62	1.9121	6 29 45.5	8.900
17	22 55 57.33	1.9117	6 20 50.6	8.930
18	22 57 52.02	1.9114	6 11 53.9	8.959
19	22 59 46.70	1.9112	6 2 55.5	8.988
20	23 1 41.37	1.9111	5 53 55.3	9.017
21	23 3 36.03	1.9109	5 44 53.4	9.046
22	23 5 30.68	1.9108	5 35 49.8	9.073
23	23 7 25.33	1.9108	S. 5 26 44.6	9.100

SUNDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 9 19.98	1.9108	S. 5 17 37.8	9.127
1	23 11 14.63	1.9108	5 8 29.4	9.152
2	23 13 9.28	1.9108	4 59 19.5	9.177
3	23 15 3.93	1.9109	4 50 8.1	9.202
4	23 16 58.59	1.9111	4 40 55.2	9.227
5	23 18 53.26	1.9113	4 31 40.9	9.251
6	23 20 47.95	1.9116	4 22 25.1	9.275
7	23 22 42.65	1.9118	4 13 7.9	9.297
8	23 24 37.37	1.9122	4 3 49.4	9.319
9	23 26 32.12	1.9127	3 54 29.6	9.341
10	23 28 26.89	1.9131	3 45 8.5	9.362
11	23 30 21.69	1.9135	3 35 46.1	9.383
12	23 32 16.51	1.9140	3 26 22.5	9.403
13	23 34 11.37	1.9146	3 16 57.7	9.423
14	23 36 6.26	1.9152	3 7 31.7	9.442
15	23 38 1.19	1.9159	2 58 4.6	9.461
16	23 39 56.16	1.9166	2 48 36.4	9.478
17	23 41 51.18	1.9173	2 39 7.2	9.496
18	23 43 46.24	1.9181	2 29 36.9	9.513
19	23 45 41.35	1.9190	2 20 5.6	9.529
20	23 47 36.52	1.9199	2 10 33.4	9.545
21	23 49 31.74	1.9208	2 1 0.2	9.561
22	23 51 27.02	1.9218	1 51 26.1	9.575
23	23 53 22.36	1.9229	1 41 51.2	9.589
24	23 55 17.77	1.9240	S. 1 32 15.4	9.603

MONDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 55 17.77	1.9240	S. 1 32 15.4	9.603
1	23 57 13.24	1.9252	1 22 38.8	9.616
2	23 59 8.79	1.9264	1 13 1.5	9.629
3	0 1 4.41	1.9276	1 3 23.4	9.641
4	0 3 0.10	1.9288	0 53 44.6	9.652
5	0 4 55.87	1.9302	0 44 5.1	9.663
6	0 6 51.73	1.9317	0 34 25.0	9.673
7	0 8 47.67	1.9331	0 24 44.3	9.683
8	0 10 43.70	1.9346	0 15 3.0	9.692
9	0 12 39.82	1.9362	S. 0 5 21.2	9.701
10	0 14 36.04	1.9377	N. 0 4 21.1	9.708
11	0 16 32.35	1.9393	0 14 3.8	9.716
12	0 18 28.76	1.9411	0 23 47.0	9.723
13	0 20 25.28	1.9429	0 33 30.6	9.729
14	0 22 21.91	1.9447	0 43 14.5	9.734
15	0 24 18.64	1.9465	0 52 58.7	9.739
16	0 26 15.49	1.9485	1 2 43.2	9.744
17	0 28 12.46	1.9505	1 12 28.0	9.748
18	0 30 9.55	1.9525	1 22 13.0	9.751
19	0 32 6.76	1.9546	1 31 58.1	9.754
20	0 34 4.10	1.9567	1 41 43.4	9.756
21	0 36 1.57	1.9589	1 51 28.8	9.757
22	0 37 59.17	1.9611	2 1 14.2	9.757
23	0 39 56.90	1.9633	N. 2 10 59.6	9.757

TUESDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 41 54.77	1.9657	N. 2 20 45.1	9.757
1	0 43 52.79	1.9682	2 30 30.5	9.756
2	0 45 50.95	1.9706	2 40 15.8	9.754
3	0 47 49.26	1.9732	2 50 1.0	9.752
4	0 49 47.73	1.9757	2 59 46.0	9.748
5	0 51 46.35	1.9783	3 9 30.8	9.744
6	0 53 45.13	1.9810	3 19 15.3	9.739
7	0 55 44.07	1.9838	3 28 59.5	9.734
8	0 57 43.18	1.9866	3 38 43.4	9.729
9	0 59 42.46	1.9894	3 48 27.0	9.722
10	1 1 41.91	1.9922	3 58 10.1	9.715
11	1 3 41.53	1.9952	4 7 52.8	9.707
12	1 5 41.33	1.9982	4 17 35.0	9.698
13	1 7 41.31	2.0012	4 27 16.6	9.689
14	1 9 41.48	2.0044	4 36 57.7	9.680
15	1 11 41.84	2.0076	4 46 38.2	9.669
16	1 13 42.39	2.0108	4 56 18.0	9.657
17	1 15 43.14	2.0141	5 5 57.0	9.644
18	1 17 44.08	2.0173	5 15 35.3	9.631
19	1 19 45.22	2.0207	5 25 12.8	9.617
20	1 21 46.57	2.0242	5 34 49.4	9.603
21	1 23 48.13	2.0277	5 44 25.2	9.588
22	1 25 49.89	2.0312	5 54 0.0	9.573
23	1 27 51.87	2.0348	6 3 33.9	9.557
24	1 29 54.07	2.0385	N. 6 13 6.8	9.539

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 29 54.07	2.0385	N. 6 13 6.8	9.539
1	1 31 56.49	2.0422	6 22 38.6	9.521
2	1 33 59.13	2.0459	6 32 9.3	9.502
3	1 36 2.00	2.0497	6 41 38.8	9.482
4	1 38 5.10	2.0536	6 51 7.1	9.461
5	1 40 8.43	2.0575	7 0 34.1	9.439
6	1 42 12.00	2.0615	7 9 59.8	9.417
7	1 44 15.81	2.0655	7 19 24.1	9.394
8	1 46 19.86	2.0696	7 28 47.1	9.371
9	1 48 24.16	2.0737	7 38 8.6	9.346
10	1 50 28.71	2.0779	7 47 28.6	9.320
11	1 52 33.51	2.0821	7 56 47.0	9.293
12	1 54 38.56	2.0863	8 6 3.8	9.266
13	1 56 43.87	2.0907	8 15 18.9	9.238
14	1 58 49.44	2.0951	8 24 32.3	9.209
15	2 0 55.28	2.0995	8 33 44.0	9.180
16	2 3 1.38	2.1040	8 42 53.9	9.149
17	2 5 7.76	2.1086	8 52 1.9	9.117
18	2 7 14.41	2.1132	9 1 7.9	9.084
19	2 9 21.34	2.1177	9 10 12.0	9.051
20	2 11 28.54	2.1223	9 19 14.0	9.016
21	2 13 36.02	2.1271	9 28 13.9	8.981
22	2 15 43.79	2.1318	9 37 11.7	8.945
23	2 17 51.84	2.1366	N. 9 46 7.3	8.907

THURSDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	2 20 0.18	2.1415	N. 9 55 0.6	8.869
1	2 22 8.82	2.1464	10 3 51.6	8.830
2	2 24 17.75	2.1513	10 12 40.2	8.790
3	2 26 26.98	2.1563	10 21 26.4	8.749
4	2 28 36.51	2.1613	10 30 10.1	8.707
5	2 30 46.34	2.1664	10 38 51.2	8.663
6	2 32 56.48	2.1715	10 47 29.7	8.619
7	2 35 6.92	2.1766	10 56 5.5	8.574
8	2 37 17.67	2.1818	11 4 38.6	8.528
9	2 39 28.74	2.1871	11 13 8.9	8.482
10	2 41 40.12	2.1923	11 21 36.4	8.434
11	2 43 51.82	2.1977	11 30 1.0	8.385
12	2 46 3.84	2.2030	11 38 22.6	8.334
13	2 48 16.18	2.2083	11 46 41.1	8.283
14	2 50 28.84	2.2137	11 54 56.5	8.231
15	2 52 41.83	2.2192	12 3 8.8	8.178
16	2 54 55.14	2.2246	12 11 17.8	8.123
17	2 57 8.78	2.2302	12 19 23.5	8.068
18	2 59 22.76	2.2357	12 27 25.9	8.012
19	3 1 37.07	2.2412	12 35 24.9	7.953
20	3 3 51.71	2.2468	12 43 20.3	7.893
21	3 6 6.69	2.2525	12 51 12.1	7.833
22	3 8 22.01	2.2582	12 59 0.3	7.773
23	3 10 37.67	2.2638	13 6 44.9	7.712
24	3 12 53.66	2.2694	N.13 14 25.7	7.648

FRIDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 12 53.66	2.2694	N.13 14 25.7	7.648
1	3 15 9.99	2.2751	13 22 2.7	7.584
2	3 17 26.67	2.2809	13 29 35.8	7.518
3	3 19 43.70	2.2867	13 37 4.9	7.451
4	3 22 1.07	2.2924	13 44 29.9	7.383
5	3 24 18.79	2.2982	13 51 50.9	7.315
6	3 26 36.85	2.3039	13 59 7.7	7.244
7	3 28 55.26	2.3097	14 6 20.2	7.173
8	3 31 14.02	2.3155	14 13 28.5	7.102
9	3 33 33.12	2.3213	14 20 32.4	7.028
10	3 35 52.58	2.3272	14 27 31.9	6.953
11	3 38 12.39	2.3331	14 34 26.8	6.877
12	3 40 32.55	2.3389	14 41 17.1	6.800
13	3 42 53.06	2.3447	14 48 2.8	6.722
14	3 45 13.92	2.3506	14 54 43.7	6.642
15	3 47 35.13	2.3565	15 1 19.8	6.562
16	3 49 56.70	2.3624	15 7 51.1	6.480
17	3 52 18.62	2.3682	15 14 17.4	6.397
18	3 54 40.89	2.3741	15 20 38.7	6.312
19	3 57 3.51	2.3799	15 26 54.9	6.227
20	3 59 26.48	2.3857	15 33 6.0	6.141
21	4 1 49.79	2.3915	15 39 11.8	6.053
22	4 4 13.46	2.3974	15 45 12.3	5.964
23	4 6 37.48	2.4032	N.15 51 7.5	5.874

SATURDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	4 9 1.84	2.4089	N.15 56 57.2	5.783
1	4 11 26.55	2.4147	16 2 41.4	5.691
2	4 13 51.60	2.4204	16 8 20.1	5.598
3	4 16 17.00	2.4262	16 13 53.1	5.503
4	4 18 42.74	2.4319	16 19 20.4	5.407
5	4 21 8.82	2.4376	16 24 41.9	5.309
6	4 23 35.25	2.4432	16 29 57.5	5.211
7	4 26 2.01	2.4488	16 35 7.2	5.112
8	4 28 29.11	2.4544	16 40 10.9	5.012
9	4 30 56.54	2.4600	16 45 8.6	4.910
10	4 33 24.31	2.4655	16 50 0.1	4.807
11	4 35 52.40	2.4709	16 54 45.4	4.703
12	4 38 20.82	2.4763	16 59 24.4	4.598
13	4 40 49.56	2.4818	17 3 57.1	4.492
14	4 43 18.63	2.4872	17 8 23.4	4.384
15	4 45 48.02	2.4924	17 12 43.2	4.276
16	4 48 17.72	2.4977	17 16 56.5	4.167
17	4 50 47.74	2.5029	17 21 3.2	4.056
18	4 53 18.07	2.5080	17 25 3.2	3.944
19	4 55 48.70	2.5131	17 28 56.5	3.832
20	4 58 19.64	2.5182	17 32 43.0	3.718
21	5 0 50.88	2.5232	17 36 22.7	3.604
22	5 3 22.42	2.5281	17 39 55.5	3.488
23	5 5 54.25	2.5329	17 43 21.3	3.371
24	5 8 26.37	2.5377	N.17 46 40.0	3.253

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 17.					**TUESDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 8 26.37	2.5377	N.17 46 40.0	3.253	0	7 14 5.32	2.6574	N.17 53 40.8	3.113
1	5 10 58.78	2.5425	17 49 51.7	3.135	1	7 16 44.76	2.6572	17 50 29.9	3.249
2	5 13 31.47	2.5471	17 52 56.2	3.015	2	7 19 24.19	2.6569	17 47 10.9	3.385
3	5 16 4.43	2.5517	17 55 53.5	2.895	3	7 22 3.59	2.6564	17 43 43.7	3.521
4	5 18 37.67	2.5562	17 58 43.6	2.773	4	7 24 42.96	2.6558	17 40 8.4	3.656
5	5 21 11.17	2.5605	18 1 26.3	2.650	5	7 27 22.29	2.6552	17 36 25.0	3.791
6	5 23 44.93	2.5648	18 4 1.6	2.527	6	7 30 1.58	2.6544	17 32 33.5	3.925
7	5 26 18.95	2.5691	18 6 29.5	2.403	7	7 32 40.82	2.6535	17 28 34.0	4.058
8	5 28 53.23	2.5734	18 8 50.0	2.279	8	7 35 20.00	2.6524	17 24 26.5	4.191
9	5 31 27.76	2.5775	18 11 3.0	2.154	9	7 37 59.11	2.6512	17 20 11.1	4.323
10	5 34 2.53	2.5815	18 13 8.5	2.027	10	7 40 38.15	2.6500	17 15 47.8	4.454
11	5 36 37.54	2.5854	18 15 6.3	1.899	11	7 43 17.11	2.6487	17 11 16.6	4.586
12	5 39 12.78	2.5893	18 16 56.4	1.771	12	7 45 55.99	2.6472	17 6 37.5	4.717
13	5 41 48.25	2.5931	18 18 38.8	1.642	13	7 48 34.78	2.6457	17 1 50.6	4.846
14	5 44 23.95	2.5967	18 20 13.5	1.513	14	7 51 13.47	2.6440	16 56 56.0	4.974
15	5 46 59.86	2.6002	18 21 40.4	1.383	15	7 53 52.06	2.6422	16 51 53.7	5.102
16	5 49 35.98	2.6037	18 22 59.5	1.252	16	7 56 30.54	2.6404	16 46 43.8	5.229
17	5 52 12.31	2.6071	18 24 10.7	1.121	17	7 59 8.91	2.6384	16 41 26.2	5.356
18	5 54 48.83	2.6104	18 25 14.0	0.989	18	8 1 47.15	2.6363	16 36 1.1	5.481
19	5 57 25.55	2.6136	18 26 9.3	0.856	19	8 4 25.26	2.6341	16 30 28.5	5.606
20	6 0 2.46	2.6166	18 26 56.7	0.723	20	8 7 3.24	2.6319	16 24 48.4	5.730
21	6 2 39.54	2.6195	18 27 36.1	0.589	21	8 9 41.09	2.6297	16 19 0.9	5.852
22	6 5 16.80	2.6224	18 28 7.4	0.455	22	8 12 18.80	2.6273	16 13 6.1	5.973
23	6 7 54.23	2.6252	N.18 28 30.7	0.321	23	8 14 56.36	2.6247	N.16 7 4.1	6.093
	MONDAY 18.					**WEDNESDAY 20.**			
0	6 10 31.83	2.6279	N.18 28 45.9	0.185	0	8 17 33.76	2.6220	N.16 0 54.9	6.213
1	6 13 9.58	2.6304	18 28 52.9	+ 0.049	1	8 20 11.00	2.6193	15 54 38.5	6.332
2	6 15 47.48	2.6329	18 28 51.8	− 0.086	2	8 22 48.08	2.6165	15 48 15.0	6.450
3	6 18 25.53	2.6352	18 28 42.6	0.222	3	8 25 24.98	2.6135	15 41 44.5	6.566
4	6 21 3.71	2.6374	18 28 25.2	0.359	4	8 28 1.70	2.6106	15 35 7.1	6.681
5	6 23 42.02	2.6395	18 27 59.5	0.496	5	8 30 38.25	2.6076	15 28 22.8	6.795
6	6 26 20.45	2.6415	18 27 25.6	0.633	6	8 33 14.62	2.6046	15 21 31.7	6.908
7	6 28 59.00	2.6434	18 26 43.5	0.771	7	8 35 50.80	2.6013	15 14 33.8	7.020
8	6 31 37.66	2.6452	18 25 53.1	0.909	8	8 38 26.78	2.5980	15 7 29.3	7.130
9	6 34 16.42	2.6468	18 24 54.4	1.047	9	8 41 2.56	2.5947	15 0 18.2	7.240
10	6 36 55.28	2.6483	18 23 47.5	1.184	10	8 43 38.14	2.5913	14 53 0.5	7.348
11	6 39 34.22	2.6497	18 22 32.3	1.322	11	8 46 13.51	2.5878	14 45 36.4	7.454
12	6 42 13.24	2.6510	18 21 8.8	1.461	12	8 48 48.68	2.5843	14 38 6.0	7.559
13	6 44 52.34	2.6522	18 19 37.0	1.599	13	8 51 23.63	2.5807	14 30 29.3	7.663
14	6 47 31.50	2.6532	18 17 56.9	1.737	14	8 53 58.36	2.5770	14 22 46.4	7.767
15	6 50 10.72	2.6542	18 16 8.5	1.876	15	8 56 32.87	2.5732	14 14 57.3	7.868
16	6 52 50.00	2.6551	18 14 11.8	2.014	16	8 59 7.15	2.5694	14 7 2.2	7.968
17	6 55 29.33	2.6558	18 12 6.8	2.152	17	9 1 41.20	2.5656	13 59 1.1	8.067
18	6 58 8.70	2.6564	18 9 53.6	2.289	18	9 4 15.03	2.5618	13 50 54.2	8.163
19	7 0 48.10	2.6568	18 7 32.1	2.427	19	9 6 48.62	2.5578	13 42 41.5	8.259
20	7 3 27.52	2.6572	18 5 2.3	2.565	20	9 9 21.97	2.5538	13 34 23.1	8.354
21	7 6 6.96	2.6574	18 2 24.3	2.702	21	9 11 55.08	2.5498	13 25 59.0	8.447
22	7 8 46.41	2.6576	17 59 38.0	2.840	22	9 14 27.95	2.5458	13 17 29.4	8.539
23	7 11 25.87	2.6576	17 56 43.5	2.977	23	9 17 0.57	2.5417	13 8 54.3	8.629
24	7 14 5.32	2.6574	N.17 53 40.8	3.113	24	9 19 32.95	2.5375	N.13 0 13.9	8.718

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 19 32.95	2.5375	N. 13 0 13.9	8.718
1	9 22 5.07	2.5332	12 51 28.2	8.805
2	9 24 36.94	2.5290	12 42 37.3	8.890
3	9 27 8.55	2.5248	12 33 41.4	8.973
4	9 29 39.91	2.5205	12 24 40.5	9.056
5	9 32 11.01	2.5161	12 15 34.6	9.138
6	9 34 41.84	2.5117	12 6 23.9	9.218
7	9 37 12.41	2.5073	11 57 8.5	9.296
8	9 39 42.72	2.5029	11 47 48.4	9.372
9	9 42 12.76	2.4984	11 38 23.8	9.447
10	9 44 42.53	2.4940	11 28 54.7	9.521
11	9 47 12.04	2.4896	11 19 21.3	9.593
12	9 49 41.28	2.4851	11 9 43.6	9.663
13	9 52 10.25	2.4806	11 0 1.7	9.732
14	9 54 38.95	2.4760	10 50 15.7	9.799
15	9 57 7.37	2.4714	10 40 25.8	9.864
16	9 59 35.52	2.4669	10 30 32.0	9.929
17	10 2 3.40	2.4623	10 20 34.3	9.992
18	10 4 31.00	2.4578	10 10 32.9	10.053
19	10 6 58.33	2.4533	10 0 27.9	10.112
20	10 9 25.39	2.4487	9 50 19.4	10.170
21	10 11 52.17	2.4440	9 40 7.5	10.227
22	10 14 18.67	2.4394	9 29 52.2	10.282
23	10 16 44.90	2.4349	N. 9 19 33.7	10.335

FRIDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 19 10.86	2.4303	N. 9 9 12.0	10.387
1	10 21 36.54	2.4257	8 58 47.2	10.437
2	10 24 1.95	2.4212	8 48 19.5	10.485
3	10 26 27.09	2.4167	8 37 49.0	10.532
4	10 28 51.96	2.4122	8 27 15.7	10.578
5	10 31 16.55	2.4076	8 16 39.6	10.623
6	10 33 40.87	2.4031	8 6 0.9	10.666
7	10 36 4.92	2.3986	7 55 19.7	10.707
8	10 38 28.70	2.3941	7 44 36.1	10.746
9	10 40 52.21	2.3896	7 33 50.2	10.783
10	10 43 15.45	2.3852	7 23 2.1	10.820
11	10 45 38.43	2.3807	7 12 11.8	10.856
12	10 48 1.14	2.3762	7 1 19.4	10.889
13	10 50 23.58	2.3718	6 50 25.1	10.921
14	10 52 45.76	2.3675	6 39 28.9	10.952
15	10 55 7.68	2.3632	6 28 30.9	10.981
16	10 57 29.34	2.3588	6 17 31.2	11.008
17	10 59 50.74	2.3545	6 6 29.9	11.035
18	11 2 11.88	2.3502	5 55 27.0	11.060
19	11 4 32.76	2.3459	5 44 22.7	11.083
20	11 6 53.39	2.3417	5 33 17.0	11.105
21	11 9 13.77	2.3375	5 22 10.1	11.125
22	11 11 33.89	2.3333	5 11 2.0	11.145
23	11 13 53.77	2.3292	4 59 52.7	11.163
24	11 16 13.40	2.3251	N. 4 48 42.4	11.180

SATURDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 16 13.40	2.3251	N. 4 48 42.4	11.180
1	11 18 32.78	2.3210	4 37 31.1	11.195
2	11 20 51.92	2.3170	4 26 19.0	11.207
3	11 23 10.82	2.3130	4 15 6.2	11.219
4	11 25 29.48	2.3090	4 3 52.7	11.231
5	11 27 47.90	2.3050	3 52 38.5	11.241
6	11 30 6.08	2.3011	3 41 23.8	11.249
7	11 32 24.03	2.2972	3 30 8.7	11.256
8	11 34 41.75	2.2934	3 18 53.1	11.262
9	11 36 59.24	2.2896	3 7 37.2	11.267
10	11 39 16.50	2.2858	2 56 21.0	11.271
11	11 41 33.54	2.2822	2 45 4.7	11.272
12	11 43 50.36	2.2785	2 33 48.3	11.273
13	11 46 6.96	2.2748	2 22 31.9	11.272
14	11 48 23.34	2.2712	2 11 15.6	11.271
15	11 50 39.51	2.2677	1 59 59.4	11.268
16	11 52 55.46	2.2641	1 48 43.4	11.264
17	11 55 11.20	2.2607	1 37 27.7	11.258
18	11 57 26.74	2.2572	1 26 12.4	11.252
19	11 59 42.07	2.2538	1 14 57.5	11.244
20	12 1 57.20	2.2505	1 3 43.1	11.236
21	12 4 12.13	2.2472	0 52 29.2	11.227
22	12 6 26.86	2.2438	0 41 15.9	11.215
23	12 8 41.39	2.2406	N. 0 30 3.4	11.202

SUNDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 10 55.73	2.2374	N. 0 18 51.7	11.189
1	12 13 9.88	2.2342	N. 0 7 40.8	11.175
2	12 15 23.84	2.2312	S. 0 3 29.3	11.160
3	12 17 37.62	2.2282	0 14 38.4	11.143
4	12 19 51.22	2.2252	0 25 46.5	11.126
5	12 22 4.64	2.2222	0 36 53.5	11.107
6	12 24 17.88	2.2192	0 47 59.3	11.087
7	12 26 30.94	2.2163	0 59 3.9	11.067
8	12 28 43.84	2.2136	1 10 7.3	11.045
9	12 30 56.57	2.2108	1 21 9.3	11.022
10	12 33 9.13	2.2080	1 32 9.9	10.998
11	12 35 21.53	2.2052	1 43 9.1	10.974
12	12 37 33.76	2.2026	1 54 6.8	10.948
13	12 39 45.84	2.2000	2 5 2.9	10.922
14	12 41 57.76	2.1974	2 15 57.4	10.894
15	12 44 9.53	2.1949	2 26 50.2	10.866
16	12 46 21.15	2.1924	2 37 41.3	10.837
17	12 48 32.62	2.1899	2 48 30.6	10.806
18	12 50 43.94	2.1875	2 59 18.0	10.774
19	12 52 55.12	2.1852	3 10 3.5	10.742
20	12 55 6.16	2.1829	3 20 47.1	10.709
21	12 57 17.07	2.1807	3 31 28.6	10.675
22	12 59 27.84	2.1784	3 42 8.1	10.641
23	13 1 38.48	2.1762	3 52 45.5	10.606
24	13 3 48.99	2.1741	S. 4 3 20.8	10.570

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
			MONDAY 25.					WEDNESDAY 27.	
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 3 48.99	2.1741	S. 4 3 20.8	10.570	0	14 46 27.85	2.1163	S. 11 34 55.8	8.006
1	13 5 59.37	2.1720	4 13 53.9	10.532	1	14 48 34.82	2.1159	11 42 54.2	7.939
2	13 8 9.63	2.1700	4 24 24.7	10.493	2	14 50 41.76	2.1154	11 50 48.5	7.872
3	13 10 19.77	2.1680	4 34 53.1	10.454	3	14 52 48.67	2.1150	11 58 38.8	7.804
4	13 12 29.79	2.1660	4 45 19.2	10.415	4	14 54 55.56	2.1147	12 6 25.0	7.736
5	13 14 39.69	2.1641	4 55 42.9	10.374	5	14 57 2.43	2.1143	12 14 7.1	7.667
6	13 16 49.48	2.1622	5 6 4.1	10.333	6	14 59 9.28	2.1140	12 21 45.0	7.597
7	13 18 59.16	2.1604	5 16 22.8	10.291	7	15 1 16.11	2.1137	12 29 18.7	7.527
8	13 21 8.73	2.1586	5 26 39.0	10.248	8	15 3 22.92	2.1134	12 36 48.2	7.457
9	13 23 18.19	2.1568	5 36 52.6	10.205	9	15 5 29.72	2.1132	12 44 13.5	7.386
10	13 25 27.55	2.1551	5 47 3.6	10.161	10	15 7 36.50	2.1129	12 51 34.5	7.315
11	13 27 36.80	2.1534	5 57 11.9	10.116	11	15 9 43.26	2.1126	12 58 51.3	7.244
12	13 29 45.95	2.1518	6 7 17.5	10.070	12	15 11 50.01	2.1124	13 6 3.8	7.172
13	13 31 55.01	2.1502	6 17 20.3	10.024	13	15 13 56.75	2.1122	13 13 11.9	7.099
14	13 34 3.97	2.1486	6 27 20.3	9.977	14	15 16 3.48	2.1120	13 20 15.7	7.026
15	13 36 12.84	2.1471	6 37 17.5	9.929	15	15 18 10.19	2.1118	13 27 15.1	6.953
16	13 38 21.62	2.1456	6 47 11.8	9.880	16	15 20 16.89	2.1117	13 34 10.1	6.880
17	13 40 30.31	2.1442	6 57 3.1	9.831	17	15 22 23.59	2.1116	13 41 0.7	6.807
18	13 42 38.92	2.1427	7 6 51.5	9.781	18	15 24 30.28	2.1114	13 47 46.9	6.732
19	13 44 47.44	2.1413	7 16 36.8	9.730	19	15 26 36.96	2.1113	13 54 28.6	6.657
20	13 46 55.88	2.1401	7 26 19.1	9.679	20	15 28 43.64	2.1112	14 1 5.8	6.583
21	13 49 4.25	2.1388	7 35 58.3	9.627	21	15 30 50.31	2.1111	14 7 38.6	6.508
22	13 51 12.54	2.1375	7 45 34.3	9.574	22	15 32 56.97	2.1110	14 14 6.8	6.432
23	13 53 20.75	2.1362	S. 7 55 7.2	9.522	23	15 35 3.63	2.1110	S. 14 20 30.4	6.356
			TUESDAY 26.					THURSDAY 28.	
0	13 55 28.89	2.1351	S. 8 4 36.9	9.468	0	15 37 10.29	2.1109	S. 14 26 49.5	6.280
1	13 57 36.96	2.1340	8 14 3.4	9.413	1	15 39 16.94	2.1109	14 33 4.0	6.203
2	13 59 44.97	2.1329	8 23 26.5	9.358	2	15 41 23.59	2.1109	14 39 13.9	6.126
3	14 1 52.91	2.1318	8 32 46.3	9.303	3	15 43 30.24	2.1109	14 45 19.1	6.049
4	14 4 0.79	2.1307	8 42 2.8	9.246	4	15 45 36.89	2.1109	14 51 19.7	5.972
5	14 6 8.60	2.1297	8 51 15.9	9.189	5	15 47 43.54	2.1108	14 57 15.7	5.894
6	14 8 16.35	2.1287	9 0 25.5	9.132	6	15 49 50.18	2.1107	15 3 7.0	5.816
7	14 10 24.04	2.1278	9 9 31.7	9.074	7	15 51 56.82	2.1107	15 8 53.6	5.737
8	14 12 31.68	2.1269	9 18 34.4	9.016	8	15 54 3.46	2.1107	15 14 35.5	5.658
9	14 14 39.27	2.1260	9 27 33.6	8.957	9	15 56 10.11	2.1107	15 20 12.6	5.579
10	14 16 46.80	2.1252	9 36 29.2	8.897	10	15 58 16.75	2.1107	15 25 45.0	5.500
11	14 18 54.29	2.1244	9 45 21.2	8.837	11	16 0 23.40	2.1108	15 31 12.6	5.420
12	14 21 1.73	2.1236	9 54 9.6	8.776	12	16 2 30.05	2.1108	15 36 35.4	5.340
13	14 23 9.12	2.1228	10 2 54.3	8.714	13	16 4 36.70	2.1108	15 41 53.4	5.260
14	14 25 16.47	2.1221	10 11 35.3	8.652	14	16 6 43.35	2.1108	15 47 6.6	5.180
15	14 27 23.77	2.1214	10 20 12.6	8.590	15	16 8 50.00	2.1108	15 52 15.0	5.099
16	14 29 31.03	2.1207	10 28 46.1	8.528	16	16 10 56.65	2.1108	15 57 18.5	5.018
17	14 31 38.25	2.1201	10 37 15.9	8.465	17	16 13 3.30	2.1109	16 2 17.1	4.937
18	14 33 45.44	2.1195	10 45 41.9	8.401	18	16 15 9.96	2.1110	16 7 10.9	4.856
19	14 35 52.59	2.1189	10 54 4.0	8.336	19	16 17 16.62	2.1110	16 11 59.8	4.774
20	14 37 59.71	2.1183	11 2 22.2	8.272	20	16 19 23.28	2.1110	16 16 43.8	4.692
21	14 40 6.79	2.1177	11 10 36.6	8.207	21	16 21 29.94	2.1110	16 21 22.8	4.609
22	14 42 13.84	2.1172	11 18 47.0	8.140	22	16 23 36.60	2.1111	16 25 56.9	4.527
23	14 44 20.86	2.1167	11 26 53.4	8.073	23	16 25 43.27	2.1112	16 30 26.1	4.445
24	14 46 27.85	2.1163	S. 11 34 55.8	8.006	24	16 27 49.94	2.1112	S. 16 34 50.3	4.362

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 27 49.94	2.1112	S.16 34 50.3	4.362
1	16 29 56.61	2.1112	16 39 9.5	4.278
2	16 32 3.28	2.1112	16 43 23.7	4.196
3	16 34 9.95	2.1112	16 47 33.0	4.113
4	16 36 16.62	2.1112	16 51 37.3	4.029
5	16 38 23.29	2.1111	16 55 36.5	3.945
6	16 40 29.95	2.1111	16 59 30.7	3.862
7	16 42 36.62	2.1112	17 3 19.9	3.778
8	16 44 43.29	2.1111	17 7 4.0	3.693
9	16 46 49.95	2.1110	17 10 43.0	3.608
10	16 48 56.61	2.1110	17 14 16.9	3.523
11	16 51 3.27	2.1109	17 17 45.8	3.439
12	16 53 9.92	2.1108	17 21 9.6	3.354
13	16 55 16.57	2.1108	17 24 28.3	3.269
14	16 57 23.21	2.1107	17 27 41.9	3.183
15	16 59 29.85	2.1106	17 30 50.3	3.097
16	17 1 36.48	2.1105	17 33 53.6	3.012
17	17 3 43.11	2.1104	17 36 51.8	2.927
18	17 5 49.73	2.1102	17 39 44.9	2.842
19	17 7 56.34	2.1101	17 42 32.8	2.756
20	17 10 2.94	2.1099	17 45 15.6	2.670
21	17 12 9.53	2.1098	17 47 53.2	2.583
22	17 14 16.11	2.1096	17 50 25.6	2.497
23	17 16 22.68	2.1093	S.17 52 52.9	2.412

SATURDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 18 29.23	2.1091	S.17 55 15.0	2.325
1	17 20 35.77	2.1089	17 57 31.9	2.238
2	17 22 42.30	2.1087	17 59 43.6	2.152
3	17 24 48.82	2.1085	18 1 50.1	2.066
4	17 26 55.32	2.1082	18 3 51.5	1.980
5	17 29 1.80	2.1079	18 5 47.7	1.893
6	17 31 8.26	2.1076	18 7 38.7	1.807
7	17 33 14.71	2.1072	18 9 24.5	1.720
8	17 35 21.13	2.1068	18 11 5.1	1.633
9	17 37 27.53	2.1065	18 12 40.5	1.546
10	17 39 33.91	2.1062	18 14 10.6	1.459
11	17 41 40.27	2.1058	18 15 35.5	1.372
12	17 43 46.61	2.1054	18 16 55.2	1.285
13	17 45 52.92	2.1050	18 18 9.7	1.198
14	17 47 59.21	2.1046	18 19 19.0	1.112
15	17 50 5.47	2.1041	18 20 23.2	1.026
16	17 52 11.70	2.1036	18 21 22.1	0.939
17	17 54 17.90	2.1031	18 22 15.8	0.852
18	17 56 24.07	2.1026	18 23 4.4	0.766
19	17 58 30.21	2.1021	18 23 47.7	0.679
20	18 0 36.32	2.1015	18 24 25.8	0.592
21	18 2 42.39	2.1009	18 24 58.7	0.505
22	18 4 48.43	2.1003	18 25 26.4	0.419
23	18 6 54.43	2.0997	18 25 49.0	0.332
24	18 9 0.39	2.0990	S.18 26 6.3	0.245

SUNDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 9 0.39	2.0990	S.18 26 6.3	0.245
1	18 11 6.31	2.0983	18 26 18.4	0.159
2	18 13 12.19	2.0977	18 26 25.4	− 0.073
3	18 15 18.04	2.0971	18 26 27.2	+ 0.012
4	18 17 23.84	2.0964	18 26 23.9	0.098
5	18 19 29.60	2.0956	18 26 15.4	0.185
6	18 21 35.31	2.0948	18 26 1.7	0.271
7	18 23 40.97	2.0940	18 25 42.9	0.357
8	18 25 46.59	2.0932	18 25 18.9	0.442
9	18 27 52.16	2.0924	18 24 49.8	0.527
10	18 29 57.68	2.0916	18 24 15.6	0.612
11	18 32 3.15	2.0907	18 23 36.3	0.698
12	18 34 8.57	2.0898	18 22 51.8	0.784
13	18 36 13.93	2.0889	18 22 2.2	0.869
14	18 38 19.24	2.0881	18 21 7.5	0.953
15	18 40 24.50	2.0872	18 20 7.8	1.038
16	18 42 29.70	2.0862	18 19 3.0	1.123
17	18 44 34.84	2.0852	18 17 53.1	1.206
18	18 46 39.92	2.0842	18 16 38.1	1.292
19	18 48 44.94	2.0832	18 15 18.1	1.375
20	18 50 49.90	2.0821	18 13 53.1	1.459
21	18 52 54.79	2.0810	18 12 23.0	1.543
22	18 54 59.62	2.0800	18 10 47.9	1.626
23	18 57 4.39	2.0789	S.18 9 7.8	1.709

MONDAY, FEBRUARY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 59 9.09	2.0777	S.18 7 22.8	1.792

PHASES OF THE MOON.

		d	h	m
● New Moon .	January	4	19	43.7
☽ First Quarter . . .		13	0	24.4
○ Full Moon		19	19	44.8
☾ Last Quarter. . . .		26	13	31.3

		d	h
☾ Apogee. . .	January	6	21.2
☾ Perigee.		20	1.3

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Regulus	W.	90° 8′ 11″	2871	91° 41′ 7″	2879	93° 13′ 53″	2886	94° 46′ 30″	2894
	Spica	W.	36 46 13	2909	38 18 21	2914	39 50 22	2920	41 22 16	2924
	Sun	E.	42 51 1	3272	41 26 17	3282	40 1 45	3293	38 37 25	3303
2	Regulus	W.	102 27 10	2930	103 58 51	2937	105 30 23	2943	107 1 47	2949
	Spica	W.	49 0 3	2953	50 31 15	2958	52 2 20	2964	53 33 18	2969
	Sun	E.	31 38 49	3358	30 15 44	3369	28 52 52	3382	27 30 15	3394
6	Sun	W.	13 22 4	3701	14 38 50	3663	15 56 17	3634	17 14 15	3612
	α Pegasi	E.	53 52 10	3489	52 31 34	3508	51 11 19	3528	49 51 26	3550
	α Arietis	E.	96 18 8	3193	94 51 51	3194	93 25 35	3196	91 59 21	3198
7	Sun	W.	23 48 44	3550	25 8 13	3543	26 27 50	3536	27 47 34	3530
	α Pegasi	E.	43 18 48	3693	42 1 54	3730	40 45 39	3771	39 30 7	3816
	α Arietis	E.	84 48 37	3204	83 22 33	3206	81 56 31	3207	80 30 30	3208
8	Sun	W.	34 27 40	3507	35 47 56	3503	37 8 17	3498	38 28 43	3494
	α Arietis	E.	73 20 44	3214	71 54 51	3214	70 28 58	3214	69 3 6	3215
	Aldebaran	E.	105 43 47	3074	104 15 6	3073	102 46 23	3071	101 17 38	3069
9	Sun	W.	45 12 8	3470	46 33 6	3464	47 54 10	3458	49 15 21	3453
	α Arietis	E.	61 54 2	3220	60 28 16	3221	59 2 32	3222	57 36 49	3224
	Aldebaran	E.	93 53 7	3054	92 24 1	3050	90 54 50	3046	89 25 34	3041
10	Sun	W.	56 3 2	3417	57 24 59	3409	58 47 5	3400	60 9 21	3392
	α Arietis	E.	50 28 44	3234	49 3 15	3238	47 37 51	3242	46 12 32	3247
	Aldebaran	E.	81 57 38	3013	80 27 41	3005	78 57 35	2998	77 27 20	2991
11	Sun	W.	67 3 19	3342	68 26 42	3331	69 50 18	3319	71 14 8	3307
	Venus	W.	25 42 54	3151	27 10 2	3139	28 37 24	3127	30 5 1	3114
	α Arietis	E.	39 7 51	3292	37 43 30	3306	36 19 26	3324	34 55 42	3345
	Aldebaran	E.	69 53 36	2947	68 22 17	2937	66 50 45	2927	65 19 0	2916
	Saturn	E.	95 18 12	2931	93 46 32	2921	92 14 40	2911	90 42 35	2901
12	Sun	W.	78 16 53	3241	79 42 14	3226	81 7 52	3212	82 33 47	3196
	Fomalhaut	W.	41 54 56	3687	43 11 57	3627	44 30 2	3571	45 49 8	3518
	Venus	W.	37 27 3	3046	38 56 19	3031	40 25 53	3016	41 55 46	3001
	Aldebaran	E.	57 36 43	2856	56 3 28	2844	54 29 57	2830	53 56 8	2816
	Saturn	E.	82 58 38	2842	81 25 4	2828	79 51 13	2815	78 17 5	2802
13	Sun	W.	89 48 7	3114	91 15 59	3097	92 44 12	3079	94 12 47	3061
	Fomalhaut	W.	52 38 10	3297	54 2 25	3259	55 27 24	3223	56 53 6	3188
	Venus	W.	49 30 13	2916	51 2 11	2899	52 34 31	2881	54 7 14	2862
	α Pegasi	W.	37 57 47	3490	39 18 22	3424	40 40 11	3364	42 3 9	3307
	Aldebaran	E.	45 2 23	2741	43 26 38	2725	41 50 32	2710	40 14 5	2693
	Saturn	E.	70 21 51	2729	68 45 49	2713	67 9 27	2698	65 32 44	2681
	Pollux	E.	88 54 32	2821	87 20 31	2805	85 46 10	2789	84 11 28	2773
14	Sun	W.	101 41 23	2967	103 12 17	2947	104 43 36	2927	106 15 20	2908
	Fomalhaut	W.	64 11 41	3029	65 41 18	3000	67 11 31	2972	68 42 19	2944
	Venus	W	61 56 55	2766	63 32 7	2746	65 7 46	2726	66 43 51	2706
	α Pegasi	W.	49 13 8	3074	50 41 49	3034	52 11 19	2996	53 41 37	2959

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Regulus	W.	96° 18′ 57″	2901	97° 51′ 15″	2909	99° 23′ 23″	2916	100° 55′ 21″	2923
	Spica	W.	42 54 4	2930	44 25 45	2936	45 57 18	2942	47 28 44	2947
	Sun	E.	37 13 17	3313	35 49 21	3325	34 25 38	3336	33 2 7	3346
2	Regulus	W.	108 33 4	2955	110 4 13	2961	111 35 14	2967	113 6 8	2973
	Spica	W.	55 4 10	2974	56 34 55	2980	58 5 33	2985	59 36 5	2989
	Sun	E.	26 7 52	3408	24 45 45	3422	23 23 54	3438	22 2 21	3456
6	Sun	W.	18 32 36	3594	19 51 15	3579	21 10 14	3567	22 29 24	3558
	α Pegasi	E.	48 31 57	3575	47 12 55	3600	45 54 21	3629	44 36 18	3660
	α Arietis	E.	90 33 9	3199	89 6 59	3900	87 40 50	3902	86 14 43	3903
7	Sun	W.	29 7 25	3525	30 27 21	3521	31 47 22	3516	33 7 28	3511
	α Pegasi	E.	38 15 21	3865	37 1 26	3921	35 48 28	3984	34 36 33	4055
	α Arietis	E.	79 4 30	3909	77 38 32	3910	76 12 35	3911	74 46 39	3912
8	Sun	W.	39 49 14	3490	41 9 49	3485	42 30 30	3480	43 51 16	3475
	α Arietis	E.	67 37 15	3916	66 11 25	3917	64 45 36	3918	63 19 48	3920
	Aldebaran	E.	99 48 50	3066	98 19 59	3064	96 51 5	3061	95 22 8	3058
9	Sun	W.	50 36 38	3446	51 58 2	3439	53 19 34	3432	54 41 14	3425
	α Arietis	E.	56 11 8	3925	54 45 28	3927	53 19 51	3929	51 54 16	3931
	Aldebaran	E.	87 56 12	3036	86 26 44	3030	84 57 9	3025	83 27 27	3019
10	Sun	W.	61 31 47	3383	62 54 23	3373	64 17 10	3364	65 40 8	3352
	α Arietis	E.	44 47 18	3953	43 22 12	3960	41 57 14	3969	40 32 26	3980
	Aldebaran	E.	75 56 56	2983	74 26 22	2975	72 55 38	2966	71 24 43	2957
11	Sun	W.	72 38 11	3394	74 2 29	3382	75 27 1	3369	76 51 49	3355
	Venus	W.	31 32 53	3101	33 1 1	3088	34 29 25	3075	35 58 5	3060
	α Arietis	E.	33 32 22	3370	32 9 31	3400	30 47 14	3436	29 25 38	3480
	Aldebaran	E.	63 47 2	2905	62 14 50	2894	60 42 23	2882	59 9 41	2869
	Saturn	E.	89 10 17	2890	87 37 45	2878	86 4 58	2866	84 31 56	2854
12	Sun	W.	84 0 1	3180	85 26 34	3165	86 53 25	3148	88 20 36	3132
	Fomalhaut	W.	47 9 12	3469	48 30 11	3423	49 52 2	3379	51 14 42	3338
	Venus	W.	43 25 58	2985	44 56 30	2968	46 27 23	2951	47 58 37	2934
	Aldebaran	E.	51 22 1	2802	49 47 36	2788	48 12 52	2772	46 37 48	2756
	Saturn	E.	76 42 40	2788	75 7 57	2774	73 32 55	2759	71 57 33	2744
13	Sun	W.	95 41 44	3043	97 11 4	3024	98 40 47	3005	100 10 53	2986
	Fomalhaut	W.	58 19 30	3154	59 46 34	3121	61 14 18	3089	62 42 41	3059
	Venus	W.	55 40 21	2844	57 13 52	2825	58 47 48	2805	60 22 9	2786
	α Pegasi	W.	43 27 12	3255	44 52 16	3204	46 18 19	3159	47 45 17	3115
	Aldebaran	E.	38 37 16	2676	37 0 4	2659	35 22 29	2641	33 44 30	2624
	Saturn	E.	63 55 39	2665	62 18 12	2649	60 40 23	2632	59 2 11	2615
	Pollux	E.	82 36 25	2756	81 1 0	2741	79 25 14	2724	77 49 6	2707
14	Sun	W.	107 47 29	2887	109 20 4	2867	110 53 5	2847	112 26 32	2827
	Fomalhaut	W.	70 13 42	2917	71 45 39	2891	73 18 9	2866	74 51 12	2840
	Venus	W.	68 20 23	2685	69 57 23	2665	71 34 50	2644	73 12 45	2624
	α Pegasi	W.	55 12 41	2924	56 44 29	2891	58 16 59	2859	59 50 11	2828

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
14	**Saturn**	E.	57° 23′ 36″	2597	55° 44′ 37″	2580	54° 5′ 15″	2563	52° 25′ 29″	2545
	Pollux	E.	76 12 36	2690	74 35 43	2674	72 58 28	2657	71 20 50	2640
15	**Sun**	W.	114 0 25	2806	115 34 45	2785	117 9 32	2766	118 44 45	2745
	Fomalhaut	W.	76 24 48	2816	77 58 55	2792	79 33 33	2769	81 8 41	2747
	Venus	W.	74 51 8	2602	76 30 0	2582	78 9 20	2561	79 49 9	2540
	α Pegasi	W.	61 24 3	2797	62 58 35	2768	64 33 45	2740	66 9 32	2712
	Saturn	E.	44 0 31	2457	42 18 17	2440	40 35 39	2423	38 52 37	2406
	Pollux	E.	63 7 3	2558	61 27 10	2542	59 46 55	2527	58 6 19	2512
	Regulus	E.	98 50 25	2459	97 8 14	2441	95 25 37	2422	93 42 33	2402
16	**Venus**	W.	88 15 28	2437	89 58 10	2417	91 41 21	2396	93 25 1	2376
	α Pegasi	W.	74 17 21	2586	75 56 35	2563	77 36 21	2541	79 16 37	2520
	α Arietis	W.	30 57 59	2802	32 32 24	2738	34 8 14	2679	35 45 22	2626
	Pollux	E.	49 38 21	2446	47 55 52	2436	46 13 8	2426	44 30 11	2419
	Regulus	E.	85 0 19	2307	83 14 30	2289	81 28 14	2270	79 41 31	2252
17	α Arietis	W.	44 6 53	2425	45 49 52	2393	47 33 37	2364	49 18 4	2336
	Pollux	E.	35 53 39	2413	34 10 23	2422	32 27 19	2435	30 44 34	2455
	Regulus	E.	70 41 22	2167	68 52 4	2151	67 2 22	2135	65 12 16	2120
	Mars	E.	97 22 49	2196	95 34 18	2181	93 45 22	2165	91 56 2	2149
18	α Arietis	W.	58 9 33	2223	59 57 26	2204	61 45 47	2188	63 34 33	2172
	Aldebaran	W.	24 12 37	2049	26 4 55	2037	27 57 32	2026	29 50 26	2016
	Regulus	E.	55 56 17	2053	54 4 5	2041	52 11 35	2030	50 18 48	2020
	Mars	E.	82 43 39	2079	80 52 8	2067	79 0 18	2055	77 8 10	2044
	Jupiter	E.	93 35 28	2050	91 43 12	2038	89 50 37	2027	87 57 45	2016
19	α Arietis	W.	72 43 41	2112	74 34 22	2103	76 25 16	2096	78 16 21	2090
	Aldebaran	W.	39 18 40	1974	41 12 55	1968	43 7 20	1962	45 1 54	1956
	Regulus	E.	40 51 18	1981	38 57 14	1975	37 3 1	1971	35 8 41	1967
	Mars	E.	67 43 40	2001	65 50 8	1995	63 56 26	1990	62 2 36	1986
	Jupiter	E.	78 29 37	1974	76 35 22	1968	74 40 58	1963	72 46 25	1958
	Spica	E.	94 25 34	1990	92 31 44	1984	90 37 44	1979	88 43 36	1974
20	α Arietis	W.	87 33 34	2076	89 25 10	2076	91 16 46	2078	93 8 19	2081
	Aldebaran	W.	54 36 0	1949	56 30 55	1949	58 25 50	1950	60 20 43	1953
	Saturn	W.	30 5 3	1972	31 59 21	1968	33 53 45	1966	35 48 13	1965
	Mars	E.	52 32 5	1976	50 37 53	1976	48 43 41	1977	46 49 31	1980
	Jupiter	E.	63 12 20	1948	61 17 24	1949	59 22 29	1950	57 27 36	1952
	Spica	E.	79 11 41	1966	77 17 13	1967	75 22 46	1968	73 28 22	1970
21	Aldebaran	W.	69 53 47	1976	71 47 59	1983	73 42 0	1991	75 35 49	2000
	Saturn	W.	45 20 14	1979	47 14 21	1984	49 8 20	1991	51 2 8	1998
	Pollux	W.	28 4 35	2336	29 49 42	2303	31 35 37	2279	33 22 8	2260
	Mars	E.	37 20 9	2006	35 26 44	2014	33 33 32	2023	31 40 34	2033
	Jupiter	E.	47 54 27	1975	46 0 14	1982	44 6 11	1989	42 12 20	1998
	Spica	E.	63 57 48	1996	62 4 8	2004	60 10 40	2014	58 17 27	2023
22	Aldebaran	W.	85 1 12	2052	86 53 25	2064	88 45 19	2077	90 36 53	2091
	Saturn	W.	60 27 50	2048	62 20 10	2060	64 12 11	2072	66 3 53	2085
	Pollux	W	42 19 34	2225	44 7 25	2226	45 55 14	2229	47 42 59	2234

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
14	SATURN	E.	50° 45′ 18″	2527	49° 4′ 43″	2510	47° 23′ 44″	2492	45° 42′ 20″	2475
	Pollux	E.	69 42 50	2624	68 4 27	2607	66 25 42	2591	64 46 34	2574
15	SUN	W.	120 20 25	2725	121 56 31	2704	123 33 5	2684	125 10 6	2665
	Fomalhaut	W.	82 44 18	2725	84 20 24	2704	85 56 59	2684	87 34 1	2663
	VENUS	W.	81 29 27	2519	83 10 14	2498	84 51 30	2477	86 33 15	2458
	α Pegasi	W.	67 45 56	2686	69 22 55	2659	71 0 30	2634	72 38 39	2610
	SATURN	E.	37 9 11	2389	35 25 21	2373	33 41 8	2358	31 56 33	2344
	Pollux	E.	56 25 23	2497	54 44 6	2483	53 2 29	2470	51 20 34	2458
	Regulus	E.	91 59 1	2383	90 15 2	2364	88 30 35	2345	86 45 41	2326
16	VENUS	W.	95 9 10	2357	96 53 47	2338	98 38 51	2320	100 24 22	2301
	α Pegasi	W.	80 57 22	2499	82 38 36	2480	84 20 17	2461	86 2 25	2443
	α Arietis	W.	37 23 39	2580	39 3 1	2536	40 43 24	2496	42 24 43	2460
	Pollux	E.	42 47 4	2413	41 3 48	2409	39 20 26	2408	37 37 2	2408
	Regulus	E.	77 54 21	2235	76 6 45	2217	74 18 43	2200	72 30 15	2183
17	α Arietis	W.	51 3 11	2310	52 48 56	2286	54 35 16	2264	56 22 9	2243
	Pollux	E.	29 2 17	2482	27 20 38	2517	25 39 49	2566	24 0 7	2632
	Regulus	E.	63 21 47	2105	61 30 56	2091	59 39 43	2078	57 48 10	2065
	MARS	E.	90 6 18	2134	88 16 11	2119	86 25 41	2105	84 34 50	2092
18	α Arietis	W.	65 23 42	2158	67 13 13	2144	69 3 5	2132	70 53 15	2122
	Aldebaran	W.	31 43 36	2005	33 37 2	1996	35 30 42	1988	37 24 35	1981
	Regulus	E.	48 25 45	2010	46 32 27	2002	44 38 56	1994	42 45 13	1987
	MARS	E.	75 15 45	2034	73 23 4	2025	71 30 9	2017	69 37 1	2009
	JUPITER	E.	86 4 36	2007	84 11 12	1997	82 17 33	1989	80 23 41	1981
19	α Arietis	W.	80 7 35	2085	81 58 57	2081	83 50 26	2078	85 41 59	2077
	Aldebaran	W.	46 56 35	1955	48 51 21	1952	50 46 11	1950	52 41 5	1949
	Regulus	E.	33 14 15	1965	31 19 45	1963	29 25 13	1963	27 30 40	1963
	MARS	E.	60 8 39	1982	58 14 36	1979	56 20 28	1977	54 26 17	1976
	JUPITER	E.	70 51 45	1955	68 57 0	1952	67 2 10	1950	65 7 16	1948
	Spica	E.	86 49 21	1970	84 55 0	1968	83 0 36	1967	81 6 9	1966
20	α Arietis	W.	94 59 47	2085	96 51 10	2090	98 42 25	2096	100 33 31	2103
	Aldebaran	W.	62 15 32	1956	64 10 16	1960	66 4 54	1964	67 59 25	1970
	SATURN	W.	37 42 43	1965	39 37 12	1967	41 31 38	1970	43 25 59	1974
	MARS	E.	44 55 25	1984	43 1 25	1988	41 7 31	1993	39 13 45	1999
	JUPITER	E.	55 32 46	1955	53 38 1	1959	51 43 22	1963	49 48 50	1969
	Spica	E.	71 34 1	1974	69 39 46	1979	67 45 38	1984	65 51 38	1990
21	Aldebaran	W.	77 29 24	2009	79 22 45	2018	81 15 51	2029	83 8 40	2040
	SATURN	W.	52 55 45	2007	54 49 9	2016	56 42 18	2026	58 35 12	2036
	Pollux	W.	35 9 6	2246	36 56 25	2235	38 44 0	2229	40 31 45	2226
	MARS	E.	29 47 52	2044	27 55 27	2057	26 3 21	2071	24 11 37	2086
	JUPITER	E.	40 18 42	2007	38 25 18	2017	36 32 10	2027	34 39 18	2039
	Spica	E.	56 24 29	2033	54 31 47	2044	52 39 21	2056	50 47 14	2069
22	Aldebaran	W.	92 28 6	2105	94 18 57	2120	96 9 26	2134	97 59 33	2149
	SATURN	W.	67 55 15	2099	69 46 15	2013	71 36 54	2028	73 27 10	2043
	Pollux	W.	49 30 36	2240	51 18 4	2248	53 5 20	2257	54 52 23	2267

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh	P. L. of Diff.
22	JUPITER	E.	32° 46′ 44″	2050	30° 54′ 28″	2062	29° 2′ 31″	2075	27° 10′ 54″	2088
	Spica	E.	48 55 27	2083	47 4 1	2096	45 12 56	2111	43 22 14	2128
	Antares	E.	94 44 26	2114	92 53 48	2126	91 3 29	2139	89 13 30	2153
23	SATURN	W.	75 17 4	2059	77 6 34	2075	78 55 39	2091	80 44 20	2108
	Pollux	W.	56 39 11	2278	58 25 43	2290	60 11 57	2302	61 57 53	2316
	Spica	E.	34 15 18	2222	32 27 23	2243	30 40 0	2267	28 53 12	2292
	Antares	E.	80 9 0	2230	78 21 17	2247	76 34 0	2265	74 47 9	2283
	SUN	E.	135 24 44	2497	133 43 27	2514	132 2 33	2530	130 22 2	2548
24	SATURN	W.	89 41 23	2296	91 27 29	2313	93 13 9	2332	94 58 22	2350
	Pollux	W.	70 42 20	2391	72 26 7	2408	74 9 30	2425	75 52 29	2442
	Regulus	W.	34 8 21	2313	35 54 2	2330	37 39 18	2348	39 24 8	2365
	Antares	E.	65 59 40	2379	64 15 35	2400	62 32 0	2420	60 48 54	2441
	SUN	E.	122 5 36	2640	120 27 35	2658	118 49 59	2678	117 12 49	2698
25	Pollux	W.	84 21 18	2530	86 1 49	2548	87 41 55	2566	89 21 37	2584
	Regulus	W.	48 1 55	2455	49 44 11	2473	51 26 2	2491	53 7 28	2510
	MARS	W.	21 1 25	2489	22 42 53	2502	24 24 3	2516	26 4 54	2530
	Antares	E.	52 21 3	2553	50 41 3	2576	49 1 35	2599	47 22 39	2624
	SUN	E.	109 13 29	2795	107 38 54	2815	106 4 45	2834	104 31 1	2853
26	Regulus	W.	61 28 25	2596	63 7 25	2614	64 46 1	2631	66 24 14	2647
	MARS	W.	34 23 59	2607	36 2 45	2622	37 41 10	2638	39 19 14	2652
	JUPITER	W.	23 49 41	2587	25 28 54	2604	27 7 44	2620	28 46 12	2637
	Antares	E.	39 16 36	2758	37 41 13	2787	36 6 28	2818	34 32 24	2852
	SUN	E.	96 48 31	2948	95 17 13	2966	93 46 18	2985	92 15 46	3002
27	Regulus	W.	74 29 55	2725	76 6 1	2741	77 41 47	2755	79 17 14	2769
	MARS	W.	47 24 33	2725	49 0 39	2740	50 36 26	2753	52 11 55	2766
	JUPITER	W.	36 53 3	2715	38 29 23	2730	40 5 23	2744	41 41 5	2758
	Spica	W.	21 25 46	2843	22 59 18	2842	24 32 51	2845	26 6 21	2849
	SUN	E.	84 48 31	3087	83 20 6	3104	81 52 1	3119	80 24 15	3135
28	Regulus	W.	87 9 58	2835	88 43 40	2848	90 17 6	2860	91 50 16	2871
	MARS	W.	60 5 7	2828	61 38 58	2840	63 12 34	2852	64 45 55	2862
	JUPITER	W.	49 35 3	2824	51 9 0	2835	52 42 42	2848	54 16 8	2859
	Spica	W.	33 51 58	2885	35 24 36	2894	36 57 3	2901	38 29 20	2910
	SUN	E.	73 9 57	3207	71 43 56	3220	70 18 11	3233	68 52 41	3247
29	MARS	W.	72 29 22	2911	74 1 27	2920	75 33 21	2928	77 5 4	2936
	JUPITER	W.	61 59 50	2910	63 31 56	2920	65 3 50	2928	66 35 33	2937
	Spica	W.	46 8 3	2952	47 39 16	2960	49 10 19	2968	50 41 12	2975
	SUN	E.	61 48 47	3303	60 24 39	3313	59 0 43	3324	57 36 59	3333
30	JUPITER	W.	74 11 34	2974	75 42 19	2981	77 12 55	2987	78 43 24	2993
	Spica	W.	58 13 24	3009	59 43 25	3015	61 13 19	3021	62 43 6	3026
	SUN	E.	50 40 58	3377	49 18 15	3384	47 55 40	3392	46 33 14	3398
31	Spica	W.	70 10 25	3050	71 39 36	3054	73 8 42	3058	74 37 43	3062
	Antares	W.	25 46 58	3365	27 9 54	3337	28 33 23	3313	29 57 19	3294
	SUN	E.	39 42 55	3430	38 21 2	3435	36 59 35	3440	35 38 4	3445

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
22	**Jupiter**	E.	25° 19′ 37″	2103	23° 28′ 42″	2117	21° 38′ 9″	2132	19° 47′ 59″	2147
	Spica	E.	41 31 57	2144	39 42 5	2162	37 52 40	2181	36 3 44	2201
	Antares	E.	87 23 51	2167	85 34 33	2182	83 45 38	2198	81 57 7	2214
23	**Saturn**	W.	82 32 36	2225	84 20 26	2242	86 7 51	2260	87 54 50	2277
	Pollux	W.	63 43 29	2331	65 28 44	2345	67 13 38	2360	68 58 10	2375
	Spica	E.	27 7 1	2319	25 21 29	2348	23 36 40	2382	21 52 39	2421
	Antares	E.	73 0 44	2301	71 14 46	2320	69 29 16	2339	67 44 14	2359
	Sun	E.	128 41 55	2566	127 2 13	2584	125 22 55	2602	123 44 3	2621
24	**Saturn**	W.	96 43 8	2369	98 27 27	2387	100 11 20	2405	101 54 47	2424
	Pollux	W.	77 35 4	2459	79 17 15	2477	80 59 1	2494	82 40 22	2512
	Regulus	W.	41 8 33	2383	42 52 32	2401	44 36 5	2419	46 19 13	2437
	Antares	E.	59 6 18	2463	57 24 13	2485	55 42 39	2507	54 1 35	2530
	Sun	E.	115 36 6	2716	113 59 48	2736	112 23 56	2756	110 48 30	2775
25	Pollux	W.	91 0 54	2602	92 39 46	2621	94 18 13	2638	95 56 16	2656
	Regulus	W.	54 48 28	2527	56 29 4	2545	58 9 15	2562	59 49 2	2580
	Mars	W.	27 45 25	2545	29 25 35	2561	31 5 24	2576	32 44 52	2591
	Antares	E.	45 44 17	2649	44 6 29	2675	42 29 15	2701	40 52 37	2729
	Sun	E.	102 57 42	2873	101 24 48	2891	99 52 18	2911	98 20 13	2929
26	Regulus	W.	68 2 5	2663	69 39 34	2679	71 16 42	2695	72 53 29	2710
	Mars	W.	40 56 58	2668	42 34 21	2683	44 11 24	2697	45 48 8	2711
	Jupiter	W.	30 24 17	2653	32 2 0	2669	33 39 22	2684	35 16 23	2700
	Antares	E.	32 59 3	2887	31 26 28	2925	29 54 41	2967	28 23 47	3014
	Sun	E.	90 45 36	3020	89 15 48	3037	87 46 21	3055	86 17 16	3071
27	Regulus	W.	80 52 23	2783	82 27 13	2797	84 1 45	2810	85 36 0	2823
	Mars	W.	53 47 7	2780	55 22 1	2792	56 56 39	2805	58 31 1	2817
	Jupiter	W.	43 16 28	2772	44 51 33	2785	46 26 20	2798	48 0 50	2811
	Spica	W.	27 39 45	2855	29 13 2	2861	30 46 11	2869	32 19 10	2877
	Sun	E.	78 56 48	3150	77 29 39	3165	76 2 48	3179	74 36 14	3193
28	Regulus	W.	93 23 12	2882	94 55 54	2893	96 28 22	2904	98 0 36	2914
	Mars	W.	66 19 2	2873	67 51 55	2883	69 24 36	2892	70 57 5	2901
	Jupiter	W.	55 49 20	2870	57 22 17	2880	58 55 1	2891	60 27 32	2901
	Spica	W	40 1 26	2919	41 33 21	2927	43 5 6	2935	44 36 40	2944
	Sun	E.	67 27 27	3259	66 2 27	3270	64 37 40	3282	63 13 7	3293
29	**Mars**	W.	78 36 37	2944	80 8 0	2951	81 39 14	2958	83 10 19	2965
	Jupiter	W.	68 7 5	2945	69 38 27	2953	71 9 39	2961	72 40 41	2968
	Spica	W.	52 11 56	2982	53 42 31	2989	55 12 57	2996	56 43 15	3003
	Sun	E.	56 13 26	3343	54 50 4	3351	53 26 52	3360	52 3 50	3369
30	**Jupiter**	W.	80 13 45	2999	81 43 59	3004	83 14 7	3009	84 44 8	3014
	Spica	W.	64 12 47	3031	65 42 21	3037	67 11 48	3042	68 41 9	3046
	Sun	E.	45 10 55	3405	43 48 44	3412	42 26 41	3418	41 4 45	3423
31	Spica	W.	76 6 39	3065	77 35 31	3068	79 4 20	3071	80 33 5	3073
	Antares	W.	31 21 38	3277	32 46 17	3262	34 11 13	3250	35 36 23	3240
	Sun	E.	34 16 38	3450	32 55 18	3454	31 34 3	3459	30 12 53	3464

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	21 0 20.85	10.183	S. 17 1 43.8	+42.89	16 15.94	68.24	13 50.68	0.326
Tues.	2	21 4 24.82	10.149	16 44 25.4	43.63	16 15.79	68.13	13 58.09	0.292
Wed.	3	21 8 27.98	10.114	16 26 49.4	44.36	16 15.63	68.01	14 4.68	0.258
Thur.	4	21 12 30.33	10.080	16 8 56.4	+45.06	16 15.47	67.90	14 10.45	0.224
Frid.	5	21 16 31.86	10.046	15 50 46.7	45.74	16 15.31	67.78	14 15.41	0.190
Sat.	6	21 20 32.57	10.012	15 32 20.8	46.41	16 15.15	67.67	14 19.55	0.156
SUN.	7	21 24 32.46	9.978	15 13 39.1	+47.06	16 14.98	67.55	14 22.87	0.122
Mon.	8	21 28 31.53	9.944	14 54 42.0	47.69	16 14.81	67.44	14 25.38	0.088
Tues.	9	21 32 29.79	9.911	14 35 29.9	48.31	16 14.63	67.33	14 27.08	0.055
Wed.	10	21 36 27.24	9.878	14 16 3.2	+48.90	16 14.45	67.22	14 27.98	0.022
Thur.	11	21 40 23.89	9.845	13 56 22.5	49.48	16 14.27	67.11	14 28.09	0.011
Frid.	12	21 44 19.76	9.812	13 36 28.2	50.05	16 14.09	67.00	14 27.41	0.044
Sat.	13	21 48 14.85	9.780	13 16 20.5	+50.60	16 13.90	66.89	14 25.95	0.076
SUN.	14	21 52 9.18	9.748	12 55 59.9	51.12	16 13.71	66.78	14 23.73	0.108
Mon.	15	21 56 2.75	9.717	12 35 26.8	51.63	16 13.51	66.68	14 20.76	0.139
Tues.	16	21 59 55.59	9.687	12 14 41.7	+52.12	16 13.31	66.57	14 17.04	0.169
Wed.	17	22 3 47.70	9.657	11 53 45.0	52.59	16 13.10	66.47	14 12.61	0.199
Thur.	18	22 7 39.11	9.628	11 32 37.1	53.05	16 12.89	66.37	14 7.48	0.228
Frid.	19	22 11 29.82	9.599	11 11 18.3	+53.50	16 12.67	66.28	14 1.66	0.256
Sat.	20	22 15 19.87	9.572	10 49 48.9	53.92	16 12.45	66.18	13 55.17	0.283
SUN.	21	22 19 9.28	9.545	10 28 9.5	54.33	16 12.23	66.09	13 48.04	0.310
Mon.	22	22 22 58.05	9.519	10 6 20.5	+54.73	16 12.00	66.00	13 40.29	0.336
Tues.	23	22 26 46.20	9.494	9 44 22.2	55.12	16 11.77	65.91	13 31.92	0.361
Wed.	24	22 30 33.76	9.470	9 22 15.0	55.48	16 11.54	65.82	13 22.95	0.385
Thur.	25	22 34 20.74	9.446	8 59 59.3	+55.83	16 11.30	65.73	13 13.40	0.409
Frid.	26	22 38 7.17	9.423	8 37 35.6	56.15	16 11.06	65.65	13 3.31	0.432
Sat.	27	22 41 53.06	9.401	8 15 4.2	56.46	16 10.81	65.56	12 52.68	0.454
SUN.	28	22 45 38.43	9.380	7 52 25.4	56.76	16 10.57	65.48	12 41.52	0.475
Mon.	29	22 49 23.29	9.359	S. 7 29 39.7	+57.03	16 10.32	65.41	12 29.85	0.496

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^{s}.18$ from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

FEBRUARY, 1886.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Mon.	1	21 0 18.50	10.182	S. 17 1 53.8	+42.88	13 50.61	0.326	20 46 27.89
Tues.	2	21 4 22.46	10.148	16 44 35.6	43.62	13 58.02	0.292	20 50 24.44
Wed.	3	21 8 25.61	10.114	16 26 59.9	44.35	14 4.62	0.258	20 54 20.99
Thur.	4	21 12 27.95	10.080	16 9 7.1	+45.05	14 10.40	0.224	20 58 17.55
Frid.	5	21 16 29.47	10.046	15 50 57.6	45.73	14 15.37	0.190	21 2 14.10
Sat.	6	21 20 30.18	10.012	15 32 31.9	46.40	14 19.52	0.156	21 6 10.66
SUN.	7	21 24 30.07	9.978	15 13 50.4	+47.05	14 22.85	0.122	21 10 7.21
Mon.	8	21 28 29.14	9.944	14 54 53.5	47.68	14 25.37	0.088	21 14 3.77
Tues.	9	21 32 27.40	9.911	14 35 41.6	48.30	14 27.08	0.055	21 18 0.32
Wed.	10	21 36 24.86	9.878	14 16 15.1	+48.89	14 27.98	0.022	21 21 56.88
Thur.	11	21 40 21.52	9.845	13 56 34.5	49.47	14 28.09	0.011	21 25 53.43
Frid.	12	21 44 17.40	9.812	13 36 40.3	50.04	14 27.42	0.044	21 29 49.98
Sat.	13	21 48 12.50	9.780	13 16 32.7	+50.59	14 25.97	0.076	21 33 46.53
SUN.	14	21 52 6.84	9.748	12 56 12.2	51.12	14 23.75	0.108	21 37 43.09
Mon.	15	21 56 0.43	9.717	12 35 39.2	51.63	14 20.79	0.139	21 41 39.64
Tues.	16	21 59 53.28	9.687	12 14 54.2	+52.12	14 17.08	0.169	21 45 36.20
Wed.	17	22 3 45.41	9.657	11 53 57.6	52.59	14 12.66	0.199	21 49 32.75
Thur.	18	22 7 36.84	9.628	11 32 49.7	53.05	14 7.54	0.228	21 53 29.30
Frid.	19	22 11 27.57	9.600	11 11 30.9	+53.50	14 1.72	0.256	21 57 25.85
Sat.	20	22 15 17.64	9.573	10 50 1.5	53.92	13 55.23	0.283	22 1 22.41
SUN.	21	22 19 7.07	9.546	10 28 22.1	54.33	13 48.11	0.310	22 5 18.96
Mon.	22	22 22 55.87	9.520	10 6 33.1	+54.73	13 40.36	0.336	22 9 15.51
Tues.	23	22 26 44.06	9.495	9 44 34.7	55.12	13 32.00	0.361	22 13 12.06
Wed.	24	22 30 31.65	9.471	9 22 27.4	55.48	13 23.03	0.385	22 17 8.62
Thur.	25	22 34 18.66	9.447	9 0 11.6	+55.83	13 13.49	0.409	22 21 5.17
Frid.	26	22 38 5.12	9.424	8 37 47.8	56.15	13 3.40	0.432	22 25 1.72
Sat.	27	22 41 51.04	9.402	8 15 16.3	56.46	12 52.77	0.454	22 28 58.27
SUN.	28	22 45 36.44	9.381	7 52 37.4	56.76	12 41.61	0.475	22 32 54.83
Mon.	29	22 49 21.33	9.360	S. 7 29 51.6	+57.04	12 29.95	0.496	22 36 51.38

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour,
$+ 9^{s}.8565$.
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S						Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	32	312 36 56.7	36 54.6	152.20	+ 0.10	9.9937507	+ 28.4	3 13 0.40
2	33	313 37 49.0	37 46.8	152.16	+ 0.04	9.9938195	29.0	3 9 4.49
3	34	314 38 40.3	38 38.0	152.11	− 0.05	9.9938896	29.5	3 5 8.58
4	35	315 39 30.4	39 28.0	152.06	− 0.16	9.9939609	+ 30.0	3 1 12.67
5	36	316 40 19.3	40 16.7	152.01	0.28	9.9940334	30.5	2 57 16.77
6	37	317 41 6.8	41 4.1	151.95	0.41	9.9941071	31.1	2 53 20.86
7	38	318 41 52.9	41 50.1	151.89	− 0.55	9.9941822	+ 31.6	2 49 24.95
8	39	319 42 37.5	42 34.6	151.83	0.68	9.9942587	32.1	2 45 29.04
9	40	320 43 20.5	43 17.5	151.76	0.79	9.9943364	32.7	2 41 33.14
10	41	321 44 1.8	43 58.7	151.69	− 0.88	9.9944155	+ 33.3	2 37 37.23
11	42	322 44 41.5	44 38.3	151.62	0.94	9.9944961	33.9	2 33 41.32
12	43	323 45 19.5	45 16.2	151.55	0.98	9.9945784	34.7	2 29 45.41
13	44	324 45 55.8	45 52.4	151.47	− 0.99	9.9946626	+ 35.4	2 25 49.50
14	45	325 46 30.4	46 26.9	151.40	0.96	9.9947486	36.2	2 21 53.59
15	46	326 47 3.2	46 59.6	151.33	0.91	9.9948365	37.0	2 17 57.68
16	47	327 47 34.2	47 30.5	151.26	− 0.84	9.9949263	+ 37.9	2 14 1.77
17	48	328 48 3.6	47 59.8	151.19	0.74	9.9950182	38.8	2 10 5.87
18	49	329 48 31.4	48 27.5	151.12	0.62	9.9951123	39.6	2 6 9.97
19	50	330 48 57.6	48 53.6	151.06	− 0.49	9.9952084	+ 40.5	2 2 14.06
20	51	331 49 22.2	49 18.1	150.99	0.35	9.9953064	41.3	1 58 18.16
21	52	332 49 45.3	49 41.1	150.93	0.21	9.9954063	42.0	1 54 22.25
22	53	333 50 6.9	50 2.6	150.87	− 0.08	9.9955081	+ 42.8	1 50 26.34
23	54	334 50 26.9	50 22.5	150.81	+ 0.03	9.9956117	43.5	1 46 30.43
24	55	335 50 45.5	50 41.0	150.75	0.11	9.9957170	44.1	1 42 34.52
25	56	336 51 2.7	50 58.1	150.69	+ 0.17	9.9958237	+ 44.7	1 38 38.62
26	57	337 51 18.5	51 13.8	150.63	0.20	9.9959317	45.2	1 34 42.71
27	58	338 51 32.8	51 28.0	150.56	0.20	9.9960408	45.7	1 30 46.80
28	59	339 51 45.6	51 40.7	150.50	0.16	9.9961509	46.1	1 26 50.90
29	60	340 51 56.8	51 51.8	150.43	+ 0.10	9.9962618	+ 46.4	1 22 55.00

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0ᵈ.0.

Diff. for 1 Hour,
— 9ˢ.8296.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 46.2	14 44.9	54 5.4	−0.45	54 0.7	−0.33	22 56.3	1.93	27.2
2	14 44.0	14 43.6	53 57.5	−0.20	53 55.8	−0.09	23 42.4	1.89	28.2
3	14 43.4	14 43.7	53 55.3	+0.02	53 56.2	+0.13	δ		29.2
4	14 44.3	14 45.2	53 58.3	+0.23	54 1.7	+0.33	0 27.6	1.85	0.4
5	14 46.5	14 48.1	54 6.4	0.44	54 12.3	0.55	1 11.8	1.82	1.4
6	14 50.1	14 52.4	54 19.6	0.66	54 28.2	0.78	1 55.3	1.80	2.4
7	14 55.1	14 58.3	54 38.3	+0.90	54 49.9	+1.03	2 38.6	1.81	3.4
8	15 1.9	15 6.0	55 3.2	1.17	55 18.0	1.31	3 22.2	1.83	4.4
9	15 10.4	15 15.4	55 34.5	1.45	55 52.8	1.59	4 6.9	1.89	5.4
10	15 20.8	15 26.7	56 12.6	+1.73	56 34.2	+1.86	4 53.2	1.98	6.4
11	15 33.0	15 39.6	56 57.2	1.98	57 21.5	2.08	5 42.0	2.09	7.4
12	15 46.5	15 53.7	57 47.0	2.15	58 13.2	2.20	6 33.8	2.23	8.4
13	16 0.9	16 8.1	58 39.8	+2.21	59 6.3	+2.18	7 28.9	2.36	9.4
14	16 15.1	16 21.8	59 32.0	2.10	59 56.5	1.96	8 26.9	2.47	10.4
15	16 27.9	16 33.3	60 19.1	1.77	60 38.9	1.52	9 27.0	2.53	11.4
16	16 37.8	16 41.3	60 55.5	+1.22	61 8.1	+0.87	10 27.8	2.53	12.4
17	16 43.5	16 44.4	61 16.2	+0.48	61 19.6	+0.07	11 27.9	2.47	13.4
18	16 44.0	16 42.2	61 18.0	−0.35	61 11.4	−0.75	12 26.3	2.39	14.4
19	16 39.1	16 34.7	60 59.9	−1.14	60 44.0	−1.49	13 22.5	2.29	15.4
20	16 29.3	16 23.0	60 24.1	1.80	60 0.8	2.04	14 16.6	2.21	16.4
21	16 15.9	16 8.4	59 35.0	2.24	59 7.3	2.36	15 8.9	2.15	17.4
22	16 0.5	15 52.5	58 38.4	−2.43	58 9.0	−2.44	15 59.9	2.10	18.4
23	15 44.5	15 36.8	57 39.8	2.41	57 11.2	2.33	16 50.1	2.08	19.4
24	15 29.3	15 22.3	56 43.8	2.22	56 18.0	2.08	17 39.7	2.06	20.4
25	15 15.8	15 9.8	55 54.1	−1.91	55 32.2	−1.73	18 28.9	2.04	21.4
26	15 4.5	14 59.8	55 12.6	1.54	54 55.3	1.34	19 17.6	2.02	22.4
27	14 55.7	14 52.3	54 40.5	1.14	54 28.0	0.94	20 5.7	1.99	23.4
28	14 49.6	14 47.4	54 17.9	0.75	54 10.0	0.56	20 53.0	1.95	24.4
29	14 45.9	14 44.9	54 4.4	−0.39	54 0.8	−0.22	21 39.4	1.91	25.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 59 9.09	2.0777	S. 18 7 22.8	1.792
1	19 1 13.72	2.0766	18 5 32.8	1.875
2	19 3 18.28	2.0755	18 3 37.8	1.958
3	19 5 22.78	2.0744	18 1 37.8	2.041
4	19 7 27.21	2.0732	17 59 32.9	2.123
5	19 9 31.56	2.0719	17 57 23.1	2.204
6	19 11 35.84	2.0707	17 55 8.4	2.286
7	19 13 40.05	2.0695	17 52 48.8	2.367
8	19 15 44.18	2.0682	17 50 24.3	2.449
9	19 17 48.23	2.0669	17 47 54.9	2.530
10	19 19 52.21	2.0656	17 45 20.7	2.610
11	19 21 56.11	2.0643	17 42 41.7	2.690
12	19 23 59.93	2.0630	17 39 57.9	2.770
13	19 26 3.67	2.0617	17 37 9.3	2.850
14	19 28 7.33	2.0603	17 34 15.9	2.930
15	19 30 10.91	2.0590	17 31 17.7	3.009
16	19 32 14.41	2.0576	17 28 14.8	3.088
17	19 34 17.82	2.0562	17 25 7.2	3.167
18	19 36 21.15	2.0547	17 21 54.8	3.245
19	19 38 24.39	2.0533	17 18 37.8	3.322
20	19 40 27.55	2.0519	17 15 16.1	3.400
21	19 42 30.62	2.0504	17 11 49.8	3.477
22	19 44 33.60	2.0489	17 8 18.8	3.555
23	19 46 36.49	2.0475	S. 17 4 43.2	3.632

TUESDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 48 39.30	2.0461	S. 17 1 3.0	3.708
1	19 50 42.02	2.0446	16 57 18.2	3.784
2	19 52 44.65	2.0430	16 53 28.9	3.859
3	19 54 47.18	2.0414	16 49 35.1	3.934
4	19 56 49.62	2.0399	16 45 36.8	4.009
5	19 58 51.97	2.0384	16 41 34.0	4.084
6	20 0 54.23	2.0368	16 37 26.7	4.158
7	20 2 56.39	2.0353	16 33 15.0	4.232
8	20 4 58.46	2.0338	16 28 58.9	4.305
9	20 7 0.44	2.0322	16 24 38.4	4.378
10	20 9 2.32	2.0305	16 20 13.5	4.451
11	20 11 4.10	2.0289	16 15 44.2	4.524
12	20 13 5.79	2.0273	16 11 10.6	4.596
13	20 15 7.38	2.0258	16 6 32.7	4.667
14	20 17 8.88	2.0242	16 1 50.6	4.738
15	20 19 10.28	2.0225	15 57 4.2	4.809
16	20 21 11.58	2.0208	15 52 13.5	4.879
17	20 23 12.78	2.0192	15 47 18.7	4.948
18	20 25 13.89	2.0177	15 42 19.7	5.017
19	20 27 14.90	2.0160	15 37 16.6	5.087
20	20 29 15.81	2.0143	15 32 9.3	5.156
21	20 31 16.62	2.0127	15 26 57.9	5.224
22	20 33 17.33	2.0110	15 21 42.4	5.291
23	20 35 17.94	2.0094	15 16 22.9	5.358
24	20 37 18.46	2.0078	S. 15 10 59.4	5.425

WEDNESDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 37 18.46	2.0078	S. 15 10 59.4	5.425
1	20 39 18.88	2.0061	15 5 31.9	5.492
2	20 41 19.20	2.0044	15 0 0.4	5.558
3	20 43 19.41	2.0028	14 54 24.9	5.624
4	20 45 19.53	2.0012	14 48 45.5	5.688
5	20 47 19.55	1.9995	14 43 2.3	5.752
6	20 49 19.47	1.9978	14 37 15.2	5.816
7	20 51 19.29	1.9962	14 31 24.3	5.880
8	20 53 19.02	1.9946	14 25 29.6	5.944
9	20 55 18.65	1.9930	14 19 31.0	6.007
10	20 57 18.18	1.9913	14 13 28.7	6.069
11	20 59 17.61	1.9897	14 7 22.7	6.131
12	21 1 16.94	1.9881	14 1 13.0	6.192
13	21 3 16.18	1.9865	13 54 59.7	6.252
14	21 5 15.32	1.9848	13 48 42.7	6.313
15	21 7 14.36	1.9832	13 42 22.1	6.373
16	21 9 13.31	1.9816	13 35 57.9	6.432
17	21 11 12.16	1.9800	13 29 30.2	6.491
18	21 13 10.91	1.9784	13 22 59.0	6.549
19	21 15 9.57	1.9769	13 16 24.3	6.607
20	21 17 8.14	1.9753	13 9 46.1	6.665
21	21 19 6.61	1.9737	13 3 4.5	6.722
22	21 21 4.99	1.9722	12 56 19.5	6.778
23	21 23 3.28	1.9707	S. 12 49 31.1	6.834

THURSDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	21 25 1.48	1.9692	S. 12 42 39.4	6.889
1	21 26 59.59	1.9677	12 35 44.4	6.944
2	21 28 57.60	1.9661	12 28 46.1	6.999
3	21 30 55.52	1.9646	12 21 44.5	7.053
4	21 32 53.35	1.9632	12 14 39.7	7.106
5	21 34 51.10	1.9617	12 7 31.8	7.158
6	21 36 48.76	1.9602	12 0 20.7	7.211
7	21 38 46.33	1.9588	11 53 6.5	7.262
8	21 40 43.82	1.9574	11 45 49.2	7.314
9	21 42 41.22	1.9560	11 38 28.8	7.365
10	21 44 38.54	1.9546	11 31 5.4	7.415
11	21 46 35.78	1.9532	11 23 39.0	7.464
12	21 48 32.93	1.9518	11 16 9.7	7.513
13	21 50 30.00	1.9505	11 8 37.4	7.562
14	21 52 26.99	1.9492	11 1 2.2	7.610
15	21 54 23.91	1.9480	10 53 24.2	7.657
16	21 56 20.75	1.9467	10 45 43.3	7.705
17	21 58 17.51	1.9454	10 37 59.6	7.752
18	22 0 14.19	1.9441	10 30 13.1	7.798
19	22 2 10.80	1.9429	10 22 23.9	7.843
20	22 4 7.34	1.9417	10 14 32.0	7.888
21	22 6 3.80	1.9404	10 6 37.4	7.932
22	22 8 0.19	1.9393	9 58 40.2	7.975
23	22 9 56.51	1.9382	9 50 40.4	8.019
24	22 11 52.77	1.9371	S. 9 42 37.9	8.062

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 11 52.77	1.9371	S. 9 42 37.9	8.062
1	22 13 48.96	1.9359	9 34 32.9	8.104
2	22 15 45.08	1.9348	9 26 25.4	8.145
3	22 17 41.14	1.9337	9 18 15.5	8.186
4	22 19 37.13	1.9327	9 10 3.1	8.227
5	22 21 33.07	1.9318	9 1 48.3	8.267
6	22 23 28.95	1.9308	8 53 31.1	8.307
7	22 25 24.77	1.9298	8 45 11.5	8.345
8	22 27 20.53	1.9289	8 36 49.7	8.383
9	22 29 16.24	1.9280	8 28 25.6	8.421
10	22 31 11.89	1.9271	8 19 59.2	8.458
11	22 33 7.49	1.9262	8 11 30.6	8.495
12	22 35 3.04	1.9254	8 2 59.8	8.531
13	22 36 58.54	1.9247	7 54 26.9	8.566
14	22 38 54.00	1.9239	7 45 51.9	8.602
15	22 40 49.41	1.9232	7 37 14.7	8.637
16	22 42 44.78	1.9224	7 28 35.5	8.670
17	22 44 40.10	1.9217	7 19 54.3	8.702
18	22 46 35.38	1.9211	7 11 11.2	8.735
19	22 48 30.63	1.9205	7 2 26.1	8.767
20	22 50 25.84	1.9198	6 53 39.1	8.799
21	22 52 21.01	1.9192	6 44 50.2	8.831
22	22 54 16.15	1.9187	6 35 59.4	8.862
23	22 56 11.26	1.9182	S. 6 27 6.8	8.891

SATURDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 58 6.34	1.9178	S. 6 18 12.5	8.920
1	23 0 1.40	1.9174	6 9 16.4	8.949
2	23 1 56.43	1.9169	6 0 18.6	8.977
3	23 3 51.43	1.9165	5 51 19.1	9.005
4	23 5 46.41	1.9162	5 42 18.0	9.032
5	23 7 41.38	1.9160	5 33 15.3	9.058
6	23 9 36.33	1.9157	5 24 11.0	9.084
7	23 11 31.26	1.9154	5 15 5.2	9.109
8	23 13 26.18	1.9152	5 5 57.9	9.134
9	23 15 21.09	1.9151	4 56 49.1	9.159
10	23 17 15.99	1.9149	4 47 38.8	9.182
11	23 19 10.88	1.9148	4 38 27.2	9.205
12	23 21 5.76	1.9147	4 29 14.2	9.227
13	23 23 0.64	1.9147	4 19 59.9	9.249
14	23 24 55.52	1.9146	4 10 44.3	9.271
15	23 26 50.41	1.9148	4 1 27.4	9.292
16	23 28 45.30	1.9149	3 52 9.3	9.312
17	23 30 40.20	1.9150	3 42 50.0	9.332
18	23 32 35.10	1.9151	3 33 29.5	9.351
19	23 34 30.01	1.9153	3 24 7.9	9.369
20	23 36 24.94	1.9156	3 14 45.2	9.386
21	23 38 19.89	1.9159	3 5 21.5	9.403
22	23 40 14.85	1.9162	2 55 56.8	9.420
23	23 42 9.83	1.9165	2 46 31.1	9.437
24	23 44 4.83	1.9169	S. 2 37 4.4	9.452

SUNDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 44 4.83	1.9169	S. 2 37 4.4	9.452
1	23 45 59.86	1.9174	2 27 36.8	9.467
2	23 47 54.92	1.9178	2 18 8.4	9.481
3	23 49 50.00	1.9183	2 8 39.1	9.495
4	23 51 45.11	1.9188	1 59 9.0	9.508
5	23 53 40.26	1.9195	1 49 38.2	9.520
6	23 55 35.45	1.9202	1 40 6.6	9.532
7	23 57 30.68	1.9208	1 30 34.3	9.543
8	23 59 25.95	1.9215	1 21 1.4	9.554
9	0 1 21.26	1.9223	1 11 27.8	9.565
10	0 3 16.62	1.9231	1 1 53.6	9.574
11	0 5 12.03	1.9239	0 52 18.9	9.583
12	0 7 7.49	1.9248	0 42 43.7	9.591
13	0 9 3.01	1.9257	0 33 8.0	9.598
14	0 10 58.58	1.9267	0 23 31.9	9.606
15	0 12 54.21	1.9277	0 13 55.3	9.612
16	0 14 49.90	1.9287	S. 0 4 18.4	9.618
17	0 16 45.66	1.9298	N. 0 5 18.9	9.624
18	0 18 41.48	1.9309	0 14 56.5	9.628
19	0 20 37.37	1.9322	0 24 34.3	9.632
20	0 22 33.34	1.9335	0 34 12.3	9.636
21	0 24 29.39	1.9348	0 43 50.6	9.639
22	0 26 25.52	1.9361	0 53 29.0	9.641
23	0 28 21.72	1.9374	N. 1 3 7.5	9.642

MONDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 30 18.00	1.9388	N. 1 12 46.1	9.643
1	0 32 14.37	1.9402	1 22 24.7	9.643
2	0 34 10.83	1.9417	1 32 3.3	9.643
3	0 36 7.38	1.9433	1 41 41.9	9.642
4	0 38 4.03	1.9449	1 51 20.4	9.641
5	0 40 0.77	1.9465	2 0 58.8	9.639
6	0 41 57.61	1.9482	2 10 37.0	9.636
7	0 43 54.55	1.9499	2 20 15.1	9.632
8	0 45 51.60	1.9517	2 29 52.9	9.627
9	0 47 48.76	1.9536	2 39 30.4	9.622
10	0 49 46.03	1.9554	2 49 7.6	9.617
11	0 51 43.41	1.9573	2 58 44.4	9.611
12	0 53 40.90	1.9592	3 8 20.9	9.604
13	0 55 38.51	1.9612	3 17 56.9	9.597
14	0 57 36.25	1.9633	3 27 32.5	9.589
15	0 59 34.11	1.9653	3 37 7.6	9.581
16	1 1 32.09	1.9675	3 46 42.2	9.571
17	1 3 30.21	1.9697	3 56 16.1	9.560
18	1 5 28.46	1.9720	4 5 49.4	9.550
19	1 7 26.85	1.9742	4 15 22.1	9.538
20	1 9 25.37	1.9765	4 24 54.0	9.526
21	1 11 24.03	1.9789	4 34 25.2	9.513
22	1 13 22.84	1.9813	4 43 55.6	9.500
23	1 15 21.79	1.9838	4 53 25.2	9.486
24	1 17 20.89	1.9863	N. 5 2 53.9	9.471

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 17 20.89	1.9863	N. 5 2 53.9	9.471
1	1 19 20.15	1.9889	5 12 21.7	9.455
2	1 21 19.56	1.9915	5 21 48.5	9.439
3	1 23 19.13	1.9942	5 31 14.4	9.422
4	1 25 18.86	1.9968	5 40 39.2	9.404
5	1 27 18.75	1.9996	5 50 2.9	9.385
6	1 29 18.81	2.0024	5 59 25.4	9.366
7	1 31 19.04	2.0053	6 8 46.8	9.347
8	1 33 19.44	2.0082	6 18 7.0	9.326
9	1 35 20.02	2.0111	6 27 25.9	9.304
10	1 37 20.77	2.0141	6 36 43.5	9.282
11	1 39 21.71	2.0172	6 45 59.8	9.260
12	1 41 22.83	2.0202	6 55 14.7	9.237
13	1 43 24.13	2.0233	7 4 28.2	9.212
14	1 45 25.62	2.0265	7 13 40.2	9.187
15	1 47 27.31	2.0297	7 22 50.6	9.161
16	1 49 29.19	2.0330	7 31 59.5	9.135
17	1 51 31.27	2.0362	7 41 6.8	9.107
18	1 53 33.54	2.0395	7 50 12.4	9.079
19	1 55 36.01	2.0429	7 59 16.3	9.050
20	1 57 38.69	2.0464	8 8 18.4	9.020
21	1 59 41.58	2.0499	8 17 18.7	8.990
22	2 1 44.68	2.0534	8 26 17.2	8.959
23	2 3 47.99	2.0570	N. 8 35 13.8	8.927

WEDNESDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	2 5 51.52	2.0606	N. 8 44 8.5	8.895
1	2 7 55.26	2.0642	8 53 1.2	8.861
2	2 9 59.22	2.0679	9 1 51.8	8.826
3	2 12 3.41	2.0717	9 10 40.3	8.791
4	2 14 7.83	2.0756	9 19 26.7	8.756
5	2 16 12.48	2.0794	9 28 11.0	8.719
6	2 18 17.36	2.0833	9 36 53.0	8.681
7	2 20 22.47	2.0872	9 45 32.7	8.642
8	2 22 27.82	2.0911	9 54 10.1	8.603
9	2 24 33.40	2.0951	10 2 45.1	8.563
10	2 26 39.23	2.0992	10 11 17.6	8.522
11	2 28 45.30	2.1032	10 19 47.7	8.481
12	2 30 51.61	2.1073	10 28 15.3	8.438
13	2 32 58.17	2.1115	10 36 40.3	8.394
14	2 35 4.99	2.1157	10 45 2.6	8.350
15	2 37 12.06	2.1200	10 53 22.3	8.305
16	2 39 19.39	2.1242	11 1 39.2	8.259
17	2 41 26.97	2.1285	11 9 53.3	8.212
18	2 43 34.81	2.1328	11 18 4.6	8.164
19	2 45 42.91	2.1372	11 26 13.0	8.115
20	2 47 51.28	2.1417	11 34 18.4	8.065
21	2 49 59.91	2.1461	11 42 20.8	8.015
22	2 52 8.81	2.1506	11 50 20.2	7.964
23	2 54 17.98	2.1552	11 58 16.5	7.912
24	2 56 27.43	2.1597	N.12 6 9.6	7.858

THURSDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 56 27.43	2.1597	N.12 6 9.6	7.858
1	2 58 37.15	2.1643	12 13 59.5	7.804
2	3 0 47.15	2.1689	12 21 46.1	7.749
3	3 2 57.42	2.1735	12 29 29.4	7.693
4	3 5 7.97	2.1782	12 37 9.3	7.636
5	3 7 18.80	2.1829	12 44 45.7	7.577
6	3 9 29.92	2.1877	12 52 18.6	7.518
7	3 11 41.32	2.1924	12 59 47.9	7.459
8	3 13 53.01	2.1972	13 7 13.7	7.399
9	3 16 4.99	2.2020	13 14 35.8	7.337
10	3 18 17.25	2.2068	13 21 54.1	7.274
11	3 20 29.81	2.2117	13 29 8.7	7.211
12	3 22 42.66	2.2166	13 36 19.5	7.147
13	3 24 55.80	2.2215	13 43 26.4	7.082
14	3 27 9.24	2.2265	13 50 29.3	7.015
15	3 29 22.98	2.2316	13 57 28.2	6.947
16	3 31 37.02	2.2364	14 4 23.0	6.879
17	3 33 51.35	2.2413	14 11 13.7	6.810
18	3 36 5.98	2.2463	14 18 0.2	6.739
19	3 38 20.91	2.2513	14 24 42.4	6.668
20	3 40 36.14	2.2564	14 31 20.4	6.597
21	3 42 51.68	2.2615	14 37 54.0	6.523
22	3 45 7.52	2.2665	14 44 23.2	6.449
23	3 47 23.66	2.2716	N.14 50 47.9	6.374

FRIDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	3 49 40.11	2.2767	N.14 57 8.1	6.298
1	3 51 56.86	2.2818	15 3 23.7	6.221
2	3 54 13.92	2.2869	15 9 34.6	6.142
3	3 56 31.29	2.2920	15 15 40.8	6.063
4	3 58 48.96	2.2971	15 21 42.2	5.983
5	4 1 6.94	2.3022	15 27 38.8	5.902
6	4 3 25.23	2.3074	15 33 30.5	5.820
7	4 5 43.83	2.3125	15 39 17.2	5.737
8	4 8 2.73	2.3176	15 44 58.9	5.653
9	4 10 21.94	2.3227	15 50 35.6	5.569
10	4 12 41.46	2.3278	15 56 7.2	5.483
11	4 15 1.28	2.3329	16 1 33.6	5.395
12	4 17 21.41	2.3381	16 6 54.6	5.306
13	4 19 41.85	2.3432	16 12 10.3	5.217
14	4 22 2.59	2.3483	16 17 20.7	5.128
15	4 24 23.64	2.3534	16 22 25.7	5.037
16	4 26 45.00	2.3585	16 27 25.2	4.946
17	4 29 6.66	2.3635	16 32 19.2	4.852
18	4 31 28.62	2.3686	16 37 7.5	4.758
19	4 33 50.89	2.3736	16 41 50.2	4.664
20	4 36 13.46	2.3786	16 46 27.2	4.568
21	4 38 36.32	2.3835	16 50 58.4	4.471
22	4 40 59.48	2.3885	16 55 23.7	4.372
23	4 43 22.94	2.3935	16 59 43.1	4.273
24	4 45 46.70	2.3984	N.17 3 56.5	4.173

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 45 46.70	2.3984	N.17 3 56.5	4.173
1	4 48 10.75	2.4033	17 8 3.9	4.073
2	4 50 35.10	2.4082	17 12 5.3	3.972
3	4 52 59.74	2.4131	17 16 0.6	3.870
4	4 55 24.67	2.4179	17 19 49.7	3.767
5	4 57 49.89	2.4227	17 23 32.6	3.662
6	5 0 15.39	2.4274	17 27 9.2	3.557
7	5 2 41.18	2.4322	17 30 39.4	3.451
8	5 5 7.25	2.4368	17 34 3.3	3.344
9	5 7 33.60	2.4415	17 37 20.7	3.236
10	5 10 0.23	2.4461	17 40 31.6	3.127
11	5 12 27.13	2.4507	17 43 36.0	3.018
12	5 14 54.31	2.4552	17 46 33.8	2.907
13	5 17 21.76	2.4597	17 49 24.9	2.796
14	5 19 49.47	2.4641	17 52 9.3	2.684
15	5 22 17.45	2.4685	17 54 47.0	2.572
16	5 24 45.69	2.4728	17 57 17.9	2.458
17	5 27 14.19	2.4771	17 59 41.9	2.343
18	5 29 42.94	2.4813	18 1 59.0	2.228
19	5 32 11.95	2.4855	18 4 9.2	2.112
20	5 34 41.20	2.4896	18 6 12.4	1.994
21	5 37 10.70	2.4937	18 8 8.5	1.876
22	5 39 40.44	2.4977	18 9 57.6	1.758
23	5 42 10.42	2.5016	N.18 11 39.5	1.639

SUNDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	5 44 40.63	2.5054	N.18 13 14.3	1.520
1	5 47 11.07	2.5093	18 14 41.9	1.399
2	5 49 41.74	2.5131	18 16 2.2	1.278
3	5 52 12.64	2.5168	18 17 15.3	1.157
4	5 54 43.76	2.5204	18 18 21.1	1.035
5	5 57 15.09	2.5239	18 19 19.5	0.912
6	5 59 46.63	2.5274	18 20 10.5	0.788
7	6 2 18.38	2.5308	18 20 54.1	0.664
8	6 4 50.33	2.5341	18 21 30.2	0.539
9	6 7 22.47	2.5373	18 21 58.8	0.414
10	6 9 54.81	2.5406	18 22 19.9	0.288
11	6 12 27.34	2.5438	18 22 33.4	0.162
12	6 15 0.06	2.5468	18 22 39.4	+ 0.036
13	6 17 32.95	2.5497	18 22 37.7	− 0.091
14	6 20 6.02	2.5526	18 22 28.4	0.218
15	6 22 39.26	2.5553	18 22 11.5	0.346
16	6 25 12.66	2.5580	18 21 46.9	0.474
17	6 27 46.22	2.5607	18 21 14.6	0.603
18	6 30 19.94	2.5632	18 20 34.5	0.732
19	6 32 53.80	2.5656	18 19 46.7	0.862
20	6 35 27.81	2.5680	18 18 51.1	0.992
21	6 38 1.96	2.5703	18 17 47.7	1.122
22	6 40 36.25	2.5725	18 16 36.5	1.252
23	6 43 10.66	2.5746	18 15 17.5	1.382
24	6 45 45.20	2.5767	N.18 13 50.7	1.512

MONDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 45 45.20	2.5767	N.18 13 50.7	1.512
1	6 48 19.86	2.5786	18 12 16.0	1.643
2	6 50 54.63	2.5804	18 10 33.5	1.773
3	6 53 29.51	2.5822	18 8 43.2	1.904
4	6 56 4.49	2.5838	18 6 45.0	2.036
5	6 58 39.57	2.5853	18 4 38.9	2.167
6	7 1 14.73	2.5868	18 2 24.9	2.298
7	7 3 49.98	2.5882	18 0 3.1	2.429
8	7 6 25.31	2.5895	17 57 33.4	2.561
9	7 9 0.72	2.5907	17 54 55.8	2.692
10	7 11 36.20	2.5918	17 52 10.4	2.822
11	7 14 11.74	2.5928	17 49 17.1	2.953
12	7 16 47.34	2.5937	17 46 16.0	3.084
13	7 19 22.99	2.5945	17 43 7.1	3.214
14	7 21 58.68	2.5952	17 39 50.3	3.345
15	7 24 34.42	2.5960	17 36 25.7	3.475
16	7 27 10.20	2.5965	17 32 53.3	3.605
17	7 29 46.00	2.5969	17 29 13.1	3.735
18	7 32 21.83	2.5973	17 25 25.1	3.864
19	7 34 57.68	2.5976	17 21 29.4	3.993
20	7 37 33.54	2.5977	17 17 26.0	4.122
21	7 40 9.41	2.5978	17 13 14.8	4.251
22	7 42 45.28	2.5978	17 8 55.9	4.378
23	7 45 21.15	2.5977	N.17 4 29.4	4.505

TUESDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 47 57.01	2.5976	N.16 59 55.3	4.632
1	7 50 32.86	2.5973	16 55 13.6	4.759
2	7 53 8.69	2.5969	16 50 24.3	4.885
3	7 55 44.49	2.5964	16 45 27.4	5.010
4	7 58 20.26	2.5958	16 40 23.1	5.134
5	8 0 55.99	2.5953	16 35 11.3	5.259
6	8 3 31.69	2.5947	16 29 52.0	5.383
7	8 6 7.35	2.5938	16 24 25.3	5.506
8	8 8 42.95	2.5928	16 18 51.3	5.628
9	8 11 18.49	2.5918	16 13 10.0	5.749
10	8 13 53.97	2.5908	16 7 21.4	5.870
11	8 16 29.39	2.5897	16 1 25.6	5.990
12	8 19 4.74	2.5886	15 55 22.6	6.109
13	8 21 40.02	2.5872	15 49 12.5	6.228
14	8 24 15.21	2.5858	15 42 55.3	6.346
15	8 26 50.32	2.5844	15 36 31.0	6.462
16	8 29 25.34	2.5829	15 29 59.8	6.577
17	8 32 0.27	2.5813	15 23 21.7	6.692
18	8 34 35.10	2.5797	15 16 36.7	6.807
19	8 37 9.83	2.5779	15 9 44.9	6.920
20	8 39 44.45	2.5761	15 2 46.3	7.032
21	8 42 18.96	2.5742	14 55 41.1	7.142
22	8 44 53.36	2.5723	14 48 29.3	7.252
23	8 47 27.64	2.5703	14 41 10.9	7.362
24	8 50 1.80	2.5682	N.14 33 45.9	7.470

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 50 1.80	2.5682	N.14 33 45.9	7.470
1	8 52 35.83	2.5661	14 26 14.5	7.576
2	8 55 9.73	2.5639	14 18 36.8	7.681
3	8 57 43.50	2.5617	14 10 52.8	7.785
4	9 0 17.13	2.5593	14 3 2.6	7.888
5	9 2 50.61	2.5568	13 55 6.2	7.991
6	9 5 23.95	2.5544	13 47 3.7	8.092
7	9 7 57.14	2.5519	13 38 55.2	8.192
8	9 10 30.18	2.5494	13 30 40.7	8.290
9	9 13 3.07	2.5468	13 22 20.4	8.387
10	9 15 35.80	2.5442	13 13 54.3	8.482
11	9 18 8.37	2.5414	13 5 22.5	8.577
12	9 20 40.77	2.5386	12 56 45.1	8.670
13	9 23 13.00	2.5358	12 48 2.1	8.762
14	9 25 45.07	2.5331	12 39 13.6	8.852
15	9 28 16.97	2.5302	12 30 19.8	8.941
16	9 30 48.69	2.5272	12 21 20.7	9.029
17	9 33 20.24	2.5243	12 12 16.3	9.117
18	9 35 51.61	2.5213	12 3 6.7	9.202
19	9 38 22.80	2.5182	11 53 52.1	9.285
20	9 40 53.80	2.5152	11 44 32.5	9.367
21	9 43 24.62	2.5121	11 35 8.1	9.447
22	9 45 55.25	2.5089	11 25 38.9	9.527
23	9 48 25.69	2.5058	N.11 16 4.9	9.605

THURSDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 50 55.95	2.5027	N.11 6 26.3	9.681
1	9 53 26.01	2.4994	10 56 43.2	9.756
2	9 55 55.87	2.4961	10 46 55.6	9.829
3	9 58 25.54	2.4928	10 37 3.7	9.901
4	10 0 55.01	2.4895	10 27 7.5	9.972
5	10 3 24.28	2.4862	10 17 7.1	10.041
6	10 5 53.36	2.4829	10 7 2.6	10.108
7	10 8 22.23	2.4795	9 56 54.2	10.173
8	10 10 50.90	2.4762	9 46 41.8	10.238
9	10 13 19.37	2.4728	9 36 25.6	10.301
10	10 15 47.63	2.4693	9 26 5.7	10.362
11	10 18 15.69	2.4659	9 15 42.2	10.422
12	10 20 43.54	2.4625	9 5 15.1	10.480
13	10 23 11.19	2.4591	8 54 44.6	10.537
14	10 25 38.63	2.4556	8 44 10.7	10.592
15	10 28 5.86	2.4521	8 33 33.6	10.645
16	10 30 32.88	2.4487	8 22 53.3	10.697
17	10 32 59.70	2.4452	8 12 10.0	10.747
18	10 35 26.31	2.4417	8 1 23.7	10.796
19	10 37 52.71	2.4382	7 50 34.5	10.843
20	10 40 18.90	2.4347	7 39 42.5	10.888
21	10 42 44.88	2.4312	7 28 47.9	10.932
22	10 45 10.65	2.4278	7 17 50.7	10.975
23	10 47 36.22	2.4244	7 6 50.9	11.017
24	10 50 1.58	2.4209	N. 6 55 48.7	11.056

FRIDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 50 1.58	2.4209	N. 6 55 48.7	11.056
1	10 52 26.73	2.4174	6 44 44.2	11.093
2	10 54 51.67	2.4139	6 33 37.5	11.129
3	10 57 16.40	2.4105	6 22 28.7	11.164
4	10 59 40.93	2.4071	6 11 17.8	11.197
5	11 2 5.25	2.4036	6 0 5.0	11.229
6	11 4 29.36	2.4002	5 48 50.3	11.260
7	11 6 53.27	2.3967	5 37 33.8	11.288
8	11 9 16.97	2.3933	5 26 15.7	11.314
9	11 11 40.47	2.3900	5 14 56.1	11.339
10	11 14 3.77	2.3866	5 3 35.0	11.364
11	11 16 26.86	2.3832	4 52 12.4	11.387
12	11 18 49.75	2.3798	4 40 48.5	11.408
13	11 21 12.44	2.3765	4 29 23.4	11.427
14	11 23 34.93	2.3732	4 17 57.2	11.445
15	11 25 57.22	2.3698	4 6 30.0	11.461
16	11 28 19.31	2.3666	3 55 1.9	11.476
17	11 30 41.21	2.3633	3 43 32.9	11.490
18	11 33 2.91	2.3601	3 32 3.1	11.502
19	11 35 24.42	2.3568	3 20 32.6	11.512
20	11 37 45.73	2.3536	3 9 1.6	11.521
21	11 40 6.85	2.3504	2 57 30.1	11.528
22	11 42 27.78	2.3473	2 45 58.2	11.535
23	11 44 48.52	2.3442	N. 2 34 25.9	11.540

SATURDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 47 9.08	2.3411	N. 2 22 53.4	11.543
1	11 49 29.45	2.3379	2 11 20.7	11.545
2	11 51 49.63	2.3348	1 59 48.0	11.546
3	11 54 9.62	2.3317	1 48 15.3	11.544
4	11 56 29.43	2.3287	1 36 42.7	11.542
5	11 58 49.07	2.3258	1 25 10.2	11.539
6	12 1 8.53	2.3228	1 13 38.0	11.533
7	12 3 27.81	2.3198	1 2 6.2	11.527
8	12 5 46.91	2.3169	0 50 34.7	11.521
9	12 8 5.84	2.3140	0 39 3.7	11.512
10	12 10 24.59	2.3111	0 27 33.3	11.501
11	12 12 43.17	2.3082	0 16 3.6	11.489
12	12 15 1.58	2.3054	N. 0 4 34.6	11.477
13	12 17 19.82	2.3027	S. 0 6 53.6	11.463
14	12 19 37.90	2.2999	0 18 20.9	11.447
15	12 21 55.81	2.2972	0 29 47.2	11.430
16	12 24 13.56	2.2945	0 41 12.5	11.412
17	12 26 31.15	2.2918	0 52 36.7	11.393
18	12 28 48.58	2.2892	1 3 59.7	11.373
19	12 31 5.85	2.2866	1 15 21.5	11.352
20	12 33 22.97	2.2840	1 26 41.9	11.328
21	12 35 39.93	2.2814	1 38 0.9	11.304
22	12 37 56.74	2.2789	1 49 18.4	11.280
23	12 40 13.40	2.2764	2 0 34.5	11.255
24	12 42 29.91	2.2739	S. 2 11 49.0	11.227

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 42 29.91	2.2739	S. 2 11 49.0	11.227
1	12 44 46.27	2.2715	2 23 1.8	11.198
2	12 47 2.49	2.2691	2 34 12.8	11.168
3	12 49 18.57	2.2667	2 45 22.0	11.137
4	12 51 34.50	2.2643	2 56 29.3	11.105
5	12 53 50.29	2.2621	3 7 34.6	11.073
6	12 56 5.95	2.2598	3 18 38.0	11.039
7	12 58 21.47	2.2576	3 29 39.3	11.003
8	13 0 36.86	2.2553	3 40 38.4	10.967
9	13 2 52.11	2.2531	3 51 35.3	10.930
10	13 5 7.23	2.2509	4 2 30.0	10.892
11	13 7 22.22	2.2488	4 13 22.4	10.853
12	13 9 37.09	2.2467	4 24 12.4	10.813
13	13 11 51.83	2.2447	4 34 59.9	10.772
14	13 14 6.45	2.2426	4 45 45.0	10.730
15	13 16 20.94	2.2406	4 56 27.5	10.687
16	13 18 35.32	2.2387	5 7 7.4	10.642
17	13 20 49.58	2.2367	5 17 44.6	10.597
18	13 23 3.72	2.2348	5 28 19.1	10.552
19	13 25 17.75	2.2329	5 38 50.8	10.505
20	13 27 31.67	2.2310	5 49 19.7	10.457
21	13 29 45.47	2.2291	5 59 45.7	10.409
22	13 31 59.16	2.2273	6 10 8.8	10.359
23	13 34 12.75	2.2256	S. 6 20 28.8	10.308

MONDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 36 26.23	2.2239	S. 6 30 45.8	10.257
1	13 38 39.61	2.2222	6 40 59.7	10.206
2	13 40 52.89	2.2204	6 51 10.5	10.153
3	13 43 6.06	2.2187	7 1 18.1	10.100
4	13 45 19.13	2.2171	7 11 22.5	10.046
5	13 47 32.11	2.2155	7 21 23.6	9.990
6	13 49 44.99	2.2139	7 31 21.3	9.933
7	13 51 57.78	2.2123	7 41 15.6	9.877
8	13 54 10.47	2.2107	7 51 6.5	9.820
9	13 56 23.07	2.2092	8 0 54.0	9.762
10	13 58 35.58	2.2077	8 10 37.9	9.703
11	14 0 48.00	2.2063	8 20 18.3	9.643
12	14 3 0.34	2.2050	8 29 55.1	9.583
13	14 5 12.60	2.2036	8 39 28.3	9.522
14	14 7 24.77	2.2021	8 48 57.8	9.460
15	14 9 36.85	2.2007	8 58 23.5	9.397
16	14 11 48.85	2.1994	9 7 45.4	9.333
17	14 14 0.78	2.1982	9 17 3.5	9.270
18	14 16 12.63	2.1969	9 26 17.8	9.206
19	14 18 24.40	2.1956	9 35 28.2	9.141
20	14 20 36.10	2.1943	9 44 34.7	9.076
21	14 22 47.72	2.1931	9 53 37.3	9.010
22	14 24 59.27	2.1919	10 2 35.9	8.943
23	14 27 10.75	2.1907	10 11 30.4	8.875
24	14 29 22.15	2.1895	S. 10 20 20.9	8.807

TUESDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 29 22.15	2.1895	S. 10 20 20.9	8.807
1	14 31 33.49	2.1884	10 29 7.3	8.738
2	14 33 44.76	2.1873	10 37 49.5	8.669
3	14 35 55.97	2.1862	10 46 27.6	8.600
4	14 38 7.11	2.1851	10 55 1.5	8.529
5	14 40 18.18	2.1840	11 3 31.1	8.458
6	14 42 29.19	2.1830	11 11 56.5	8.387
7	14 44 40.14	2.1820	11 20 17.6	8.316
8	14 46 51.03	2.1809	11 28 34.4	8.243
9	14 49 1.85	2.1799	11 36 46.8	8.170
10	14 51 12.62	2.1790	11 44 54.8	8.097
11	14 53 23.33	2.1780	11 52 58.4	8.023
12	14 55 33.98	2.1771	12 0 57.6	7.949
13	14 57 44.58	2.1762	12 8 52.3	7.874
14	14 59 55.12	2.1752	12 16 42.5	7.799
15	15 2 5.61	2.1743	12 24 28.2	7.723
16	15 4 16.04	2.1734	12 32 9.3	7.648
17	15 6 26.42	2.1726	12 39 45.9	7.572
18	15 8 36.75	2.1717	12 47 17.9	7.495
19	15 10 47.02	2.1708	12 54 45.3	7.417
20	15 12 57.25	2.1701	13 2 8.0	7.339
21	15 15 7.43	2.1692	13 9 26.0	7.262
22	15 17 17.56	2.1684	13 16 39.4	7.183
23	15 19 27.64	2.1676	S. 13 23 48.0	7.104

WEDNESDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 21 37.67	2.1668	S. 13 30 51.9	7.025
1	15 23 47.66	2.1661	13 37 51.0	6.946
2	15 25 57.60	2.1653	13 44 45.4	6.867
3	15 28 7.49	2.1645	13 51 35.0	6.786
4	15 30 17.34	2.1637	13 58 19.7	6.705
5	15 32 27.14	2.1629	14 4 59.6	6.625
6	15 34 36.89	2.1622	14 11 34.7	6.544
7	15 36 46.60	2.1615	14 18 4.9	6.462
8	15 38 56.27	2.1608	14 24 30.2	6.381
9	15 41 5.90	2.1601	14 30 50.6	6.299
10	15 43 15.48	2.1593	14 37 6.1	6.216
11	15 45 25.02	2.1587	14 43 16.6	6.133
12	15 47 34.52	2.1580	14 49 22.1	6.050
13	15 49 43.98	2.1573	14 55 22.6	5.968
14	15 51 53.40	2.1566	15 1 18.2	5.885
15	15 54 2.77	2.1559	15 7 8.8	5.801
16	15 56 12.10	2.1552	15 12 54.3	5.717
17	15 58 21.39	2.1546	15 18 34.8	5.633
18	16 0 30.65	2.1540	15 24 10.3	5.549
19	16 2 39.87	2.1532	15 29 40.7	5.464
20	16 4 49.04	2.1525	15 35 6.0	5.379
21	16 6 58.17	2.1518	15 40 26.2	5.294
22	16 9 7.26	2.1512	15 45 41.3	5.209
23	16 11 16.31	2.1505	15 50 51.3	5.123
24	16 13 25.32	2.1498	S. 15 55 56.1	5.038

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 13 25.32	2.1498	S. 15 55 56.1	5.038
1	16 15 34.29	2.1492	16 0 55.8	4.953
2	16 17 43.22	2.1485	16 5 50.4	4.867
3	16 19 52.11	2.1478	16 10 39.8	4.780
4	16 22 0.96	2.1472	16 15 24.0	4.694
5	16 24 9.77	2.1465	16 20 3.0	4.608
6	16 26 18.54	2.1458	16 24 36.9	4.522
7	16 28 27.27	2.1452	16 29 5.6	4.435
8	16 30 35.96	2.1445	16 33 29.1	4.347
9	16 32 44.61	2.1438	16 37 47.3	4.260
10	16 34 53.22	2.1431	16 42 0.3	4.173
11	16 37 1.78	2.1423	16 46 8.1	4.087
12	16 39 10.30	2.1417	16 50 10.7	3.999
13	16 41 18.78	2.1410	16 54 8.0	3.912
14	16 43 27.22	2.1403	16 58 0.1	3.824
15	16 45 35.62	2.1396	17 1 46.9	3.737
16	16 47 43.98	2.1389	17 5 28.5	3.649
17	16 49 52.29	2.1382	17 9 4.8	3.562
18	16 52 0.56	2.1375	17 12 35.9	3.474
19	16 54 8.79	2.1367	17 16 1.7	3.386
20	16 56 16.97	2.1360	17 19 22.2	3.297
21	16 58 25.11	2.1352	17 22 37.4	3.209
22	17 0 33.20	2.1345	17 25 47.3	3.122
23	17 2 41.25	2.1337	S. 17 28 52.0	3.034

FRIDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 4 49.25	2.1330	S. 17 31 51.4	2.946
1	17 6 57.21	2.1322	17 34 45.5	2.857
2	17 9 5.12	2.1314	17 37 34.3	2.769
3	17 11 12.98	2.1307	17 40 17.8	2.681
4	17 13 20.80	2.1299	17 42 56.0	2.593
5	17 15 28.57	2.1291	17 45 28.9	2.505
6	17 17 36.29	2.1282	17 47 56.6	2.417
7	17 19 43.96	2.1274	17 50 19.0	2.328
8	17 21 51.58	2.1266	17 52 36.0	2.239
9	17 23 59.15	2.1257	17 54 47.7	2.151
10	17 26 6.67	2.1249	17 56 54.2	2.063
11	17 28 14.14	2.1240	17 58 55.3	1.974
12	17 30 21.55	2.1231	18 0 51.1	1.886
13	17 32 28.91	2.1222	18 2 41.6	1.798
14	17 34 36.22	2.1214	18 4 26.9	1.711
15	17 36 43.48	2.1205	18 6 6.9	1.622
16	17 38 50.68	2.1196	18 7 41.6	1.534
17	17 40 57.83	2.1187	18 9 11.0	1.447
18	17 43 4.92	2.1177	18 10 35.2	1.359
19	17 45 11.95	2.1167	18 11 54.1	1.271
20	17 47 18.93	2.1158	18 13 7.7	1.182
21	17 49 25.85	2.1148	18 14 16.0	1.094
22	17 51 32.71	2.1138	18 15 19.0	1.007
23	17 53 39.51	2.1129	18 16 16.8	0.919
24	17 55 46.26	2.1120	S. 18 17 9.3	0.832

SATURDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 55 46.26	2.1120	S. 18 17 9.3	0.832
1	17 57 52.95	2.1109	18 17 56.6	0.744
2	17 59 59.57	2.1098	18 18 38.6	0.657
3	18 2 6.13	2.1088	18 19 15.4	0.570
4	18 4 12.63	2.1077	18 19 47.0	0.483
5	18 6 19.06	2.1067	18 20 13.3	0.396
6	18 8 25.43	2.1057	18 20 34.5	0.310
7	18 10 31.74	2.1046	18 20 50.5	0.222
8	18 12 37.98	2.1034	18 21 1.2	0.135
9	18 14 44.15	2.1023	18 21 6.7	− 0.048
10	18 16 50.26	2.1012	18 21 7.0	+ 0.038
11	18 18 56.30	2.1001	18 21 2.2	0.124
12	18 21 2.27	2.0989	18 20 52.2	0.210
13	18 23 8.17	2.0978	18 20 37.0	0.296
14	18 25 14.00	2.0967	18 20 16.7	0.382
15	18 27 19.77	2.0956	18 19 51.2	0.467
16	18 29 25.47	2.0943	18 19 20.6	0.552
17	18 31 31.09	2.0931	18 18 44.9	0.637
18	18 33 36.64	2.0919	18 18 4.1	0.723
19	18 35 42.12	2.0907	18 17 18.1	0.808
20	18 37 47.52	2.0894	18 16 27.1	0.892
21	18 39 52.85	2.0882	18 15 31.0	0.977
22	18 41 58.10	2.0869	18 14 29.8	1.062
23	18 44 3.28	2.0857	S. 18 13 23.6	1.146

SUNDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 46 8.38	2.0844	S. 18 12 12.3	1.230
1	18 48 13.40	2.0831	18 10 56.0	1.313
2	18 50 18.35	2.0818	18 9 34.7	1.397
3	18 52 23.22	2.0805	18 8 8.3	1.481
4	18 54 28.01	2.0792	18 6 36.9	1.564
5	18 56 32.72	2.0779	18 5 0.6	1.647
6	18 58 37.36	2.0766	18 3 19.3	1.730
7	19 0 41.92	2.0752	18 1 33.0	1.812
8	19 2 46.39	2.0738	17 59 41.8	1.894
9	19 4 50.78	2.0725	17 57 45.7	1.976
10	19 6 55.09	2.0712	17 55 44.7	2.057
11	19 8 59.32	2.0697	17 53 38.8	2.139
12	19 11 3.46	2.0683	17 51 28.0	2.221
13	19 13 7.52	2.0670	17 49 12.3	2.302
14	19 15 11.50	2.0656	17 46 51.8	2.382
15	19 17 15.39	2.0642	17 44 26.4	2.463
16	19 19 19.20	2.0627	17 41 56.2	2.543
17	19 21 22.92	2.0612	17 39 21.2	2.622
18	19 23 26.55	2.0598	17 36 41.5	2.702
19	19 25 30.10	2.0584	17 33 57.0	2.782
20	19 27 33.56	2.0569	17 31 7.7	2.861
21	19 29 36.93	2.0555	17 28 13.7	2.939
22	19 31 40.22	2.0541	17 25 15.0	3.018
23	19 33 43.42	2.0526	17 22 11.6	3.097
24	19 35 46.53	2.0511	S. 17 19 3.4	3.175

GREENWICH MEAN TIME.

PHASES OF THE MOON.

		d	h	m
● New Moon	February	3	15	14.6
☽ First Quarter		11	14	46.2
○ Full Moon		18	6	15.0
☾ Last Quarter		25	5	11.3

		d	h
☾ Apogee	February	2	22.3
☾ Perigee		17	14.1

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Spica	W.	82° 1′ 47″	3076	83° 30′ 26″	3078	84° 59′ 2″	3081	86° 27′ 35″	3082
	Antares	W.	37 1 45	3230	38 27 19	3221	39 53 3	3214	41 18 56	3207
	Sun	E.	28 51 49	3469	27 30 50	3473	26 9 56	3478	24 49 7	3483
5	Sun	W.	14 49 32	3498	16 9 58	3485	17 30 39	3472	18 51 34	3463
	α Arietis	E.	64 47 42	3206	63 21 40	3208	61 55 40	3209	60 29 41	3210
	Aldebaran	E.	96 51 49	3044	95 22 31	3042	93 53 10	3039	92 23 45	3035
6	Sun	W.	25 38 42	3422	27 0 34	3415	28 22 34	3408	29 44 42	3400
	α Arietis	E.	53 20 25	3224	51 54 44	3229	50 29 9	3234	49 3 40	3239
	Aldebaran	E.	84 55 32	3015	83 25 38	3010	81 55 38	3005	80 25 32	3001
7	Sun	W.	36 37 26	3364	38 0 24	3356	39 23 31	3348	40 46 47	3339
	α Arietis	E.	41 58 16	3284	40 33 46	3297	39 9 31	3313	37 45 35	3332
	Aldebaran	E.	72 53 26	2973	71 22 39	2966	69 51 44	2960	68 20 41	2954
	Saturn	E.	96 38 27	2969	95 7 36	2964	93 36 38	2957	92 5 31	2950
8	Sun	W.	47 45 32	3297	49 9 47	3287	50 34 14	3277	51 58 52	3267
	α Pegasi	W.	26 12 23	4748	27 12 42	4554	28 15 47	4386	29 21 21	4239
	Aldebaran	E.	60 43 13	2915	59 11 13	2907	57 39 3	2899	56 6 43	2891
	Saturn	E.	84 27 46	2913	82 55 44	2905	81 23 32	2897	79 51 9	2889
	Pollux	E.	104 20 2	3000	102 49 49	2991	101 19 25	2981	99 48 49	2972
9	Sun	W.	59 5 7	3213	60 31 1	3201	61 57 9	3189	63 23 31	3177
	α Pegasi	W.	35 19 6	3724	36 35 28	3649	37 53 9	3583	39 12 2	3522
	Aldebaran	E.	48 22 4	2841	46 48 29	2831	45 14 41	2820	43 40 39	2808
	Saturn	E.	72 6 24	2842	70 32 50	2831	68 59 2	2821	67 25 1	2810
	Pollux	E.	92 12 43	2921	90 40 51	2911	89 8 46	2900	87 36 27	2888
10	Sun	W.	70 39 13	3110	72 7 10	3096	73 35 25	3082	75 3 57	3067
	α Pegasi	W.	46 1 46	3979	47 26 22	3940	48 51 44	3903	50 17 50	3168
	Aldebaran	E.	35 46 42	2748	34 11 6	2735	32 35 13	2722	30 59 3	2709
	Saturn	E.	59 31 19	2753	57 55 49	2741	56 20 3	2728	54 44 0	2715
	Pollux	E.	79 51 14	2831	78 17 27	2819	76 43 24	2808	75 9 6	2795
11	Sun	W.	82 31 18	2989	84 1 45	2972	85 32 33	2956	87 3 41	2939
	α Pegasi	W.	57 38 22	3012	59 8 20	2984	60 38 53	2958	62 9 59	2932
	Saturn	E.	46 39 28	2649	45 1 40	2636	43 23 34	2623	41 45 10	2609
	Pollux	E.	67 13 32	2732	65 37 35	2720	64 1 22	2707	62 24 52	2695
	Regulus	E.	103 0 34	2640	101 22 33	2625	99 44 12	2610	98 5 31	2595
12	Sun	W.	94 44 49	2852	96 18 10	2834	97 51 54	2816	99 26 1	2798
	α Pegasi	W.	69 53 25	2811	71 27 38	2789	73 2 20	2767	74 37 31	2746
	α Arietis	W.	26 54 34	3196	28 20 48	3109	29 48 47	3031	31 18 21	2963
	Saturn	E.	33 28 34	2544	31 48 22	2532	30 7 53	2520	28 27 7	2509
	Pollux	E.	54 18 20	2636	52 40 14	2626	51 1 54	2615	49 23 20	2606
	Regulus	E.	89 46 40	2514	88 5 46	2497	86 24 29	2481	84 42 49	2465
13	Sun	W.	107 22 38	2706	108 59 10	2688	110 36 6	2669	112 13 27	2651
	α Pegasi	W.	82 40 19	2646	84 18 12	2627	85 56 30	2609	87 35 13	2591
	α Arietis	W.	39 5 10	2708	40 41 39	2668	42 19 2	2631	43 57 15	2596
	Pollux	E.	41 7 38	2573	39 28 6	2571	37 48 31	2572	36 8 57	2574

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LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Spica	W.	87° 56′ 6″	3084	89° 24′ 35″	3086	90° 53′ 2″	3087	92° 21′ 28″	3088
	Antares	W.	42 44 57	3201	44 11 5	3196	45 37 19	3191	47 3 39	3186
	Sun	E.	23 28 24	3488	22 7 47	3493	20 47 15	3499	19 26 50	3506
5	Sun	W.	20 12 40	3453	21 33 57	3445	22 55 23	3437	24 16 58	3429
	α Arietis	E.	59 3 44	3213	57 37 50	3215	56 11 58	3218	54 46 10	3220
	Aldebaran	E.	90 54 16	3031	89 24 42	3028	87 55 4	3024	86 25 21	3019
6	Sun	W.	31 6 59	3393	32 29 23	3386	33 51 56	3379	35 14 37	3372
	α Arietis	E.	47 38 17	3246	46 13 2	3253	44 47 56	3262	43 23 0	3272
	Aldebaran	E.	78 55 20	2996	77 25 2	2990	75 54 37	2985	74 24 5	2979
7	Sun	W.	42 10 13	3339	43 33 48	3324	44 57 32	3314	46 21 27	3306
	α Arietis	E.	36 22 0	3353	34 58 50	3378	33 36 8	3408	32 14 0	3442
	Aldebaran	E.	66 49 30	2946	65 18 10	2939	63 46 41	2931	62 15 2	2924
	Saturn	E.	90 34 16	2944	89 2 53	2936	87 31 20	2929	85 59 38	2921
8	Sun	W.	53 23 42	3257	54 48 44	3246	56 13 59	3236	57 39 26	3224
	α Pegasi	W.	30 29 10	4111	31 39 1	3997	32 50 44	3895	34 4 9	3805
	Aldebaran	E.	54 34 12	2881	53 1 29	2871	51 28 33	2862	49 55 25	2852
	Saturn	E.	78 18 36	2880	76 45 51	2870	75 12 54	2861	73 39 45	2852
	Pollux	E.	98 18 1	2962	96 47 1	2952	95 15 48	2942	93 44 22	2931
9	Sun	W.	64 50 8	3164	66 17 0	3151	67 44 8	3138	69 11 32	3124
	α Pegasi	W.	40 32 2	3466	41 53 4	3415	43 15 4	3366	44 37 59	3321
	Aldebaran	E.	42 6 22	2798	40 31 51	2785	38 57 4	2773	37 22 1	2761
	Saturn	E.	65 50 46	2799	64 16 17	2788	62 41 33	2776	61 6 34	2764
	Pollux	E.	86 3 53	2877	84 31 5	2866	82 58 3	2855	81 24 46	2843
10	Sun	W.	76 32 47	3052	78 1 56	3036	79 31 24	3021	81 1 11	3005
	α Pegasi	W.	51 44 38	3134	53 12 6	3101	54 40 14	3070	56 9 0	3041
	Aldebaran	E.	29 22 35	2695	27 45 48	2681	26 8 43	2667	24 31 19	2652
	Saturn	E.	53 7 40	2702	51 31 3	2689	49 54 9	2676	48 16 57	2663
	Pollux	E.	73 34 32	2783	71 59 42	2770	70 24 35	2758	68 49 12	2745
11	Sun	W.	88 35 11	2921	90 7 3	2905	91 39 16	2887	93 11 51	2869
	α Pegasi	W.	63 41 37	2907	65 13 47	2882	66 46 29	2858	68 19 42	2835
	Saturn	E.	40 6 27	2596	38 27 26	2583	36 48 7	2569	35 8 29	2556
	Pollux	E.	60 48 6	2684	59 11 4	2671	57 33 45	2659	55 56 10	2648
	Regulus	E.	96 26 29	2579	94 47 5	2563	93 7 19	2547	91 27 11	2530
12	Sun	W.	101 0 32	2779	102 35 28	2761	104 10 47	2743	105 46 30	2724
	α Pegasi	W.	76 13 10	2725	77 49 17	2704	79 25 51	2684	81 2 52	2665
	α Arietis	W.	32 49 20	2901	34 21 37	2847	35 55 4	2796	37 29 37	2749
	Saturn	E.	26 46 6	2499	25 4 52	2492	23 23 27	2487	21 41 55	2485
	Pollux	E.	47 44 33	2597	46 5 34	2589	44 26 24	2583	42 47 5	2577
	Regulus	E.	83 0 46	2448	81 18 19	2431	79 35 28	2414	77 52 13	2396
13	Sun	W.	113 51 13	2633	115 29 23	2615	117 7 58	2597	118 46 57	2579
	α Pegasi	W.	89 14 20	2574	90 53 50	2558	92 33 43	2542	94 13 58	2527
	α Arietis	W.	45 36 15	2564	47 16 0	2533	48 56 27	2504	50 37 35	2476
	Pollux	E.	34 29 27	2581	32 50 6	2591	31 10 59	2607	29 32 14	2629

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13	Regulus	E.	76° 8′ 33″	2380	74° 24′ 29″	2363	72° 40′ 1″	2346	70° 55′ 8″	2329
	Mars	E.	101 4 46	2311	99 19 2	2293	97 32 52	2276	95 46 17	2260
14	Sun	W.	120 26 21	2562	122 6 8	2545	123 46 19	2528	125 26 53	2511
	α Arietis	W.	52 19 22	2450	54 1 46	2424	55 44 46	2400	57 28 20	2377
	Aldebaran	W.	18 4 19	2243	19 51 42	2227	21 39 29	2212	23 27 39	2196
	Regulus	E.	62 4 40	2247	60 17 22	2231	58 29 41	2215	56 41 36	2200
	Mars	E.	86 47 10	2176	84 58 6	2160	83 8 38	2143	81 18 45	2128
	Jupiter	E.	98 45 32	2220	96 57 34	2204	95 9 12	2188	93 20 27	2172
15	α Arietis	W.	66 13 59	2277	68 0 32	2260	69 47 30	2243	71 34 53	2229
	Aldebaran	W.	32 34 11	2123	34 24 35	2110	36 15 19	2097	38 6 23	2085
	Regulus	E.	47 35 37	2129	45 45 22	2116	43 54 47	2103	42 3 53	2091
	Mars	E.	72 3 37	2056	70 11 30	2042	68 19 2	2030	66 26 15	2017
	Jupiter	E.	84 10 58	2099	82 19 58	2086	80 28 38	2074	78 36 59	2062
	Spica	E.	101 8 16	2141	99 18 20	2128	97 28 3	2115	95 37 26	2103
16	α Arietis	W.	80 37 5	2165	82 26 26	2154	84 16 3	2145	86 5 54	2137
	Aldebaran	W.	47 26 10	2031	49 18 56	2022	51 11 56	2014	53 5 9	2007
	Saturn	W.	24 20 59	2083	26 12 9	2071	28 3 47	2060	29 55 48	2046
	Regulus	E.	32 45 5	2041	30 52 35	2033	28 59 53	2027	27 7 1	2021
	Mars	E.	56 57 47	1965	55 3 18	1956	53 8 35	1949	51 13 40	1941
	Jupiter	E.	69 14 10	2007	67 20 47	1998	65 27 10	1991	63 33 21	1983
	Spica	E.	86 19 53	2048	84 27 34	2040	82 35 2	2032	80 42 17	2025
17	α Arietis	W.	95 17 44	2111	97 8 27	2109	98 59 13	2107	100 50 1	2108
	Aldebaran	W.	62 33 49	1979	64 27 57	1975	66 22 10	1974	68 16 26	1972
	Saturn	W.	39 20 17	2001	41 13 49	1996	43 7 29	1992	45 1 16	1989
	Pollux	W.	21 33 12	2604	23 12 2	2510	24 53 2	2436	26 35 46	2376
	Mars	E.	41 36 41	1919	39 40 58	1917	37 45 12	1916	35 49 25	1917
	Jupiter	E.	54 1 34	1955	52 6 49	1951	50 11 58	1949	48 17 3	1948
	Spica	E.	71 16 2	1998	69 22 25	1996	67 28 44	1994	65 35 0	1993
18	Aldebaran	W.	77 48 3	1975	79 42 16	1978	81 36 25	1982	83 30 28	1987
	Saturn	W.	54 30 56	1987	56 24 51	1989	58 18 42	1993	60 12 28	1996
	Pollux	W.	35 26 9	2212	37 14 19	2194	39 2 55	2181	40 51 51	2172
	Jupiter	E.	38 42 14	1951	36 47 22	1953	34 52 34	1957	32 57 52	1962
	Spica	E.	56 6 25	2001	54 12 52	2006	52 19 26	2011	50 26 9	2017
	Antares	E.	101 51 52	2041	99 59 22	2043	98 6 55	2047	96 14 34	2051
19	Aldebaran	W.	92 58 25	2022	94 51 25	2031	96 44 11	2041	98 36 41	2052
	Saturn	W.	69 39 14	2030	71 32 2	2039	73 24 36	2048	75 16 55	2059
	Pollux	W.	49 58 59	2157	51 48 32	2159	53 38 2	2163	55 27 26	2169
	Spica	E.	41 2 42	2064	39 10 48	2077	37 19 14	2091	35 28 1	2107
	Antares	E.	86 54 54	2085	85 3 32	2096	83 12 26	2106	81 21 36	2117
20	Saturn	W.	84 34 5	2121	86 24 32	2136	88 14 37	2150	90 4 20	2165
	Pollux	W.	64 31 49	2211	66 20 0	2223	68 7 53	2235	69 55 28	2248
	Regulus	W.	27 51 23	2126	29 41 42	2139	31 31 41	2153	33 21 19	2168
	Antares	E.	72 12 6	2185	70 23 16	2201	68 34 50	2218	66 46 49	2235
21	Pollux	W.	78 48 13	2324	80 33 37	2341	82 18 37	2357	84 3 13	2375

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13	Regulus	E.	69° 9′ 51″	2313	67° 24′ 10″	2296	65° 38′ 4″	2279	63° 51′ 34″	2263
	Mars	E.	93 59 18	2243	92 11 54	2225	90 24 4	2208	88 35 49	2192
14	Sun	W.	127 7 51	2495	128 49 11	2479	130 30 54	2464	132 12 58	2448
	α Arietis	W.	59 12 27	2355	60 57 6	2335	62 42 15	2315	64 27 53	2296
	Aldebaran	W.	25 16 12	2181	27 5 8	2166	28 54 27	2151	30 44 8	2137
	Regulus	E.	54 53 8	2185	53 4 18	2170	51 15 6	2156	49 25 32	2142
	Mars	E.	79 28 29	2113	77 37 50	2098	75 46 48	2083	73 55 23	2070
	Jupiter	E.	91 31 18	2157	89 41 46	2143	87 51 52	2128	86 1 36	2114
15	α Arietis	W.	73 22 38	2214	75 10 45	2200	76 59 13	2187	78 48 0	2175
	Aldebaran	W.	39 57 45	2073	41 49 26	2062	43 41 24	2051	45 33 39	2041
	Regulus	E.	40 12 40	2080	38 21 10	2069	36 29 23	2059	34 37 21	2050
	Mars	E.	64 33 8	2006	62 39 43	1995	60 46 1	1984	58 52 2	1974
	Jupiter	E.	76 45 1	2050	74 52 44	2038	73 0 9	2027	71 7 17	2017
	Spica	E.	93 46 31	2090	91 55 17	2079	90 3 45	2068	88 11 57	2058
16	α Arietis	W.	87 55 57	2130	89 46 11	2123	91 36 35	2118	93 27 6	2114
	Aldebaran	W.	54 58 33	2000	56 52 8	1993	58 45 53	1987	60 39 47	1982
	Saturn	W.	31 48 10	2035	33 40 50	2025	35 33 46	2016	37 26 56	2009
	Regulus	E.	25 14 0	2016	23 20 51	2013	21 27 37	2011	19 34 20	2012
	Mars	E.	49 18 33	1935	47 23 16	1930	45 27 51	1926	43 32 19	1922
	Jupiter	E.	61 39 20	1976	59 45 8	1969	57 50 45	1963	55 56 13	1959
	Spica	E.	78 49 21	2017	76 56 14	2012	75 2 58	2007	73 9 34	2001
17	α Arietis	W.	102 40 48	2109	104 31 34	2111	106 22 16	2115	108 12 53	2120
	Aldebaran	W.	70 10 45	1971	72 5 5	1970	73 59 26	1971	75 53 46	1973
	Saturn	W.	46 55 8	1986	48 49 4	1986	50 43 1	1985	52 36 59	1986
	Pollux	W.	28 19 55	2328	30 5 13	2289	31 51 28	2258	33 38 30	2233
	Mars	E.	33 53 39	1918	31 57 55	1921	30 2 16	1926	28 6 45	1933
	Jupiter	E.	46 22 6	1946	44 27 7	1946	42 32 8	1947	40 37 10	1948
	Spica	E.	63 41 15	1993	61 47 29	1994	59 53 45	1995	58 0 3	1998
18	Aldebaran	W.	85 24 23	1993	87 18 9	1998	89 11 46	2005	91 5 12	2014
	Saturn	W.	62 6 8	2001	63 59 40	2008	65 53 2	2014	67 46 14	2022
	Pollux	W.	42 41 1	2165	44 30 22	2159	46 19 51	2157	48 9 24	2155
	Jupiter	E.	31 3 18	1967	29 8 52	1974	27 14 36	1981	25 20 31	1988
	Spica	E.	48 33 2	2025	46 40 6	2033	44 47 23	2042	42 54 54	2053
	Antares	E.	94 22 19	2056	92 30 12	2062	90 38 15	2070	88 46 29	2077
19	Aldebaran	W.	100 28 55	2063	102 20 51	2075	104 12 29	2087	106 3 48	2101
	Saturn	W.	77 8 57	2070	79 0 42	2082	80 52 9	2094	82 43 17	2107
	Pollux	W.	57 16 41	2174	59 5 47	2182	60 54 41	2191	62 43 22	2200
	Spica	E.	33 37 12	2124	31 46 49	2142	29 56 54	2163	28 7 30	2186
	Antares	E.	79 31 3	2129	77 40 48	2142	75 50 53	2156	74 1 19	2170
20	Saturn	W.	91 53 40	2181	93 42 36	2198	95 31 7	2214	97 19 14	2231
	Pollux	W.	71 42 44	2262	73 29 39	2277	75 16 13	2291	77 2 25	2308
	Regulus	W.	35 10 35	2182	36 59 29	2198	38 48 0	2214	40 36 7	2231
	Antares	E.	64 59 14	2253	63 12 5	2272	61 25 24	2291	59 39 12	2311
21	Pollux	W.	85 47 23	2394	87 31 7	2412	89 14 24	2431	90 57 15	2450

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21	Regulus	W.	42° 23′ 49″	2247	44° 11′ 6″	2264	45° 57′ 58″	2282	47° 44′ 24″	2300
	Mars	W.	19 58 47	2214	21 46 53	2220	23 34 50	2229	25 22 34	2241
	Antares	E.	57 53 29	2332	56 8 16	2354	54 23 35	2376	52 39 26	2399
	Sun	E.	142 8 35	2559	140 28 44	2578	138 49 19	2597	137 10 20	2616
22	Pollux	W.	92 39 39	2469	94 21 36	2489	96 3 5	2509	97 44 6	2528
	Regulus	W.	56 29 54	2392	58 13 40	2412	59 56 58	2431	61 39 49	2450
	Mars	W.	34 16 30	2312	36 2 12	2328	37 47 31	2345	39 32 25	2362
	Jupiter	W.	20 27 44	2359	22 12 18	2378	23 56 25	2396	25 40 5	2416
	Antares	E.	44 7 14	2527	42 26 38	2555	40 46 41	2585	39 7 25	2616
	α Aquilæ	E.	93 7 25	2831	91 33 38	2851	90 0 16	2870	88 27 19	2890
	Sun	E.	129 2 5	2716	127 25 47	2738	125 49 57	2758	124 14 34	2778
23	Regulus	W.	70 7 18	2545	71 47 28	2564	73 27 12	2583	75 6 31	2601
	Mars	W.	48 10 47	2448	49 53 13	2465	51 35 15	2482	53 16 53	2500
	Jupiter	W.	34 11 37	2510	35 52 36	2529	37 33 9	2548	39 13 16	2566
	α Aquilæ	E.	80 49 10	2999	79 18 57	3024	77 49 14	3048	76 20 1	3073
	Venus	E.	107 57 47	2397	106 14 8	2415	104 30 55	2433	102 48 8	2451
	Sun	E.	116 24 22	2882	114 51 40	2901	113 19 23	2922	111 47 32	2942
24	Regulus	W.	83 16 50	2692	84 53 41	2708	86 30 10	2725	88 6 16	2742
	Mars	W.	61 39 4	2584	63 18 21	2600	64 57 16	2616	66 35 49	2632
	Jupiter	W.	47 27 39	2655	49 5 20	2672	50 42 38	2689	52 19 33	2705
	Spica	W.	30 3 24	2756	31 38 50	2767	33 14 1	2779	34 48 56	2792
	α Aquilæ	E.	69 1 55	3210	67 35 58	3240	66 10 36	3270	64 45 49	3301
	Venus	E.	94 20 32	2540	92 40 15	2558	91 0 22	2575	89 20 53	2592
	Sun	E.	104 14 30	3039	102 45 6	3058	101 16 5	3077	99 47 27	3094
25	Regulus	W.	96 1 26	2821	97 35 27	2835	99 9 9	2849	100 42 33	2862
	Mars	W.	74 43 25	2705	76 19 58	2719	77 56 12	2733	79 32 8	2746
	Jupiter	W.	60 18 50	2782	61 53 41	2797	63 28 13	2811	65 2 27	2824
	Spica	W.	42 39 27	2855	44 12 44	2867	45 45 45	2880	47 18 30	2892
	α Aquilæ	E.	57 51 22	3474	56 30 29	3514	55 10 20	3555	53 50 56	3597
	Venus	E.	81 9 5	2672	79 31 48	2688	77 54 52	2703	76 18 16	2718
	Sun	E.	92 29 33	3179	91 2 59	3194	89 36 43	3210	88 10 46	3225
26	Jupiter	W.	72 49 25	2886	74 22 2	2898	75 54 24	2908	77 26 33	2918
	Spica	W.	54 58 28	2949	56 29 45	2959	58 0 49	2969	59 31 41	2979
	α Aquilæ	E.	47 26 11	3848	46 11 58	3909	44 58 47	3973	43 46 41	4042
	Venus	E.	68 19 59	2786	66 45 13	2798	65 10 43	2811	63 36 30	2823
	Sun	E.	81 5 15	3294	79 40 56	3306	78 16 51	3318	76 53 0	3328
27	Jupiter	W.	85 4 13	2963	86 35 12	2971	88 6 1	2978	89 36 41	2985
	Spica	W.	67 3 5	3022	68 32 51	3030	70 2 27	3036	71 31 55	3043
	Antares	W.	22 57 9	3432	24 18 49	3393	25 41 14	3361	27 4 15	3335
	Venus	E.	55 49 10	2880	54 16 25	2890	52 43 53	2900	51 11 34	2909
	Sun	E.	69 56 48	3379	68 34 7	3386	67 11 35	3395	65 49 13	3402
28	Spica	W.	78 57 19	3070	80 26 5	3075	81 54 45	3079	83 23 20	3082
	Antares	W.	34 5 29	3254	35 30 34	3245	36 55 50	3236	38 21 16	3230
	Venus	E.	43 32 59	2956	42 1 51	2965	40 30 55	2974	39 0 10	2983
	Sun	E.	58 59 21	3434	57 37 43	3438	56 16 10	3444	54 54 43	3447

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21	Regulus	W.	49° 30′ 23″	2318	51° 15′ 56″	2337	53° 1′ 2″	2355	54° 45′ 41″	2373
	Mars	W.	27 10 1	2253	28 57 10	2267	30 43 58	2281	32 30 25	2296
	Antares	E.	50 55 50	2423	49 12 48	2447	47 30 20	2472	45 48 28	2499
	Sun	E.	135 31 47	2636	133 53 41	2656	132 16 2	2676	130 38 50	2696
22	Pollux	W.	99 24 40	2548	101 4 46	2569	102 44 24	2589	104 23 34	2609
	Regulus	W.	63 22 12	2470	65 4 8	2488	66 45 38	2507	68 26 41	2526
	Mars	W.	41 16 55	2379	43 1 0	2396	44 44 41	2413	46 27 57	2431
	Jupiter	W.	27 23 17	2435	29 6 2	2454	30 48 20	2472	32 30 12	2492
	Antares	E.	37 28 52	2649	35 51 4	2684	34 14 3	2722	32 37 52	2761
	α Aquilæ	E.	86 54 47	2910	85 22 41	2932	83 51 3	2954	82 19 52	2977
	Sun	E.	122 39 37	2799	121 5 8	2820	119 31 6	2841	117 57 31	2861
23	Regulus	W.	76 45 25	2620	78 23 53	2638	80 1 56	2656	81 39 35	2674
	Mars	W.	54 58 6	2517	56 38 55	2534	58 19 21	2551	59 59 24	2567
	Jupiter	W.	40 52 58	2584	42 32 15	2602	44 11 7	2620	45 49 35	2638
	α Aquilæ	E.	74 51 19	3100	73 23 9	3126	71 55 31	3153	70 28 26	3182
	Venus	E.	101 5 46	2470	99 23 50	2487	97 42 19	2505	96 1 13	2523
	Sun	E.	110 16 6	2962	108 45 5	2981	107 14 29	3001	105 44 17	3021
24	Regulus	W.	89 42 0	2758	91 17 23	2774	92 52 25	2790	94 27 6	2806
	Mars	W.	68 14 1	2647	69 51 52	2662	71 29 23	2677	73 6 34	2692
	Jupiter	W.	53 56 6	2721	55 32 18	2737	57 8 9	2753	58 43 39	2767
	Spica	W.	36 23 35	2804	37 57 58	2817	39 32 4	2829	41 5 54	2842
	α Aquilæ	E.	63 21 39	3333	61 58 6	3367	60 35 12	3401	59 12 57	3437
	Venus	E.	87 41 47	2608	86 3 3	2625	84 24 42	2641	82 46 43	2657
	Sun	E.	98 19 10	3112	96 51 15	3129	95 23 41	3146	93 56 27	3163
25	Regulus	W.	102 15 40	2876	103 48 29	2890	105 21 1	2902	106 53 17	2914
	Mars	W.	81 7 47	2759	82 43 9	2771	84 18 15	2782	85 53 6	2794
	Jupiter	W.	66 36 24	2838	68 10 3	2850	69 43 26	2862	71 16 33	2874
	Spica	W.	48 50 59	2904	50 23 13	2916	51 55 12	2927	53 26 57	2938
	α Aquilæ	E.	52 32 18	3642	51 14 29	3689	49 57 30	3738	48 41 23	3791
	Venus	E.	74 42 0	2732	73 6 2	2746	71 30 23	2759	69 55 2	2773
	Sun	E.	86 45 6	3240	85 19 44	3253	83 54 38	3268	82 29 49	3281
26	Jupiter	W.	78 58 29	2928	80 30 12	2938	82 1 43	2946	83 33 3	2954
	Spica	W.	61 2 20	2989	62 32 47	2997	64 3 3	3005	65 33 9	3014
	α Aquilæ	E.	42 35 43	4118	41 25 59	4199	40 17 32	4288	39 10 28	4385
	Venus	E.	62 2 32	2835	60 28 49	2846	58 55 21	2858	57 22 8	2869
	Sun	E.	75 29 21	3340	74 5 56	3350	72 42 42	3360	71 19 40	3369
27	Jupiter	W.	91 7 13	2992	92 37 36	2997	94 7 52	3003	95 38 1	3008
	Spica	W.	73 1 14	3050	74 30 25	3056	75 59 29	3060	77 28 27	3065
	Antares	W.	28 27 46	3313	29 51 43	3294	31 16 1	3279	32 40 37	3265
	Venus	E.	49 39 27	2919	48 7 32	2928	46 35 49	2938	45 4 18	2947
	Sun	E.	64 26 59	3410	63 4 54	3416	61 42 56	3423	60 21 5	3429
28	Spica	W.	84 51 51	3086	86 20 18	3089	87 48 41	3091	89 17 1	3093
	Antares	W.	39 46 50	3223	41 12 32	3216	42 38 22	3211	44 4 18	3207
	Venus	E.	37 29 36	2992	35 59 13	3002	34 29 2	3012	32 59 4	3022
	Sun	E.	53 33 20	3451	52 12 1	3454	50 50 46	3457	49 29 34	3459

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	22 49 23.29	9.359	S. 7 29 39.7	+57.03	16 10.32	65.41	12 29.85	0.496
Tues.	2	22 53 7.65	9.339	7 6 47.6	57.29	16 10.07	65.34	12 17.69	0.516
Wed.	3	22 56 51.53	9.319	6 43 49.5	57.54	16 9.82	65.27	12 5.06	0.536
Thur.	4	23 0 34.95	9.300	6 20 45.6	+57.77	16 9.57	65.21	11 51.97	0.555
Frid.	5	23 4 17.92	9.282	5 57 36.4	57.98	16 9.31	65.14	11 38.43	0.573
Sat.	6	23 8 0.47	9.264	5 34 22.4	58.17	16 9.06	65.08	11 24.46	0.590
SUN.	7	23 11 42.61	9.247	5 11 4.0	+58.35	16 8.81	65.02	11 10.08	0.607
Mon.	8	23 15 24.34	9.231	4 47 41.6	58.51	16 8.56	64.96	10 55.30	0.623
Tues.	9	23 19 5.69	9.215	4 24 15.5	58.66	16 8.30	64.91	10 40.14	0.639
Wed.	10	23 22 46.68	9.201	4 0 46.0	+58.79	16 8.05	64.86	10 24.62	0.653
Thur.	11	23 26 27.32	9.186	3 37 13.7	58.90	16 7.79	64.82	10 8.75	0.668
Frid.	12	23 30 7.63	9.173	3 13 38.9	58.99	16 7.53	64.77	9 52.55	0.681
Sat.	13	23 33 47.62	9.160	2 50 2.0	+59.07	16 7.27	64.73	9 36.04	0.694
SUN.	14	23 37 27.33	9.149	2 26 23.4	59.13	16 7.01	64.69	9 19.24	0.705
Mon.	15	23 41 6.77	9.138	2 2 43.5	59.18	16 6.74	64.65	9 2.17	0.716
Tues.	16	23 44 45.96	9.128	1 39 2.6	+59.22	16 6.48	64.62	8 44.85	0.726
Wed.	17	23 48 24.92	9.119	1 15 21.0	59.24	16 6.21	64.59	8 27.32	0.735
Thur.	18	23 52 3.69	9.111	0 51 39.1	59.24	16 5.94	64.56	8 9.58	0.743
Frid.	19	23 55 42.28	9.105	0 27 57.2	+59.24	16 5.67	64.54	7 51.67	0.750
Sat.	20	23 59 20.72	9.099	S. 0 4 15.8	59.22	16 5.40	64.52	7 33.61	0.755
SUN.	21	0 2 59.04	9.094	N. 0 19 24.9	59.18	16 5.12	64.51	7 15.43	0.760
Mon.	22	0 6 37.26	9.091	0 43 4.5	+59.13	16 4.84	64.50	6 57.14	0.763
Tues.	23	0 10 15.39	9.088	1 6 42.7	59.06	16 4.56	64.49	6 38.78	0.766
Wed.	24	0 13 53.48	9.086	1 30 19.2	58.98	16 4.28	64.48	6 20.36	0.768
Thur.	25	0 17 31.52	9.085	1 53 53.5	+58.88	16 4.01	64.47	6 1.90	0.769
Frid.	26	0 21 9.55	9.085	2 17 25.4	58.78	16 3.73	64.46	5 43.43	0.769
Sat.	27	0 24 47.60	9.086	2 40 54.4	58.65	16 3.45	64.46	5 24.98	0.768
SUN.	28	0 28 25.69	9.088	3 4 20.3	+58.51	16 3.17	64.46	5 6.57	0.766
Mon.	29	0 32 3.83	9.090	3 27 42.7	58.36	16 2.88	64.47	4 48.21	0.764
Tues.	30	0 35 42.03	9.094	3 51 1.3	58.19	16 2.60	64.48	4 29.91	0.760
Wed.	31	0 39 20.33	9.098	4 14 15.7	58.01	16 2.32	64.49	4 11.70	0.756
Thur.	32	0 42 58.73	9.103	N. 4 37 25.5	+57.81	16 2.04	64.51	3 53.60	0.751

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^{s}.18$ from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Mon.	1	22 49 21.33	9.360	S. 7 29 51.6	+57.04	12 29.95	0.496	22 36 51.38
Tues.	2	22 53 5.73	9.340	7 6 59.4	57.30	12 17.79	0.516	22 40 47.94
Wed.	3	22 56 49.65	9.320	6 44 1.1	57.55	12 5.16	0.536	22 44 44.49
Thur.	4	23 0 33.11	9.301	6 20 57.0	+57.78	11 52.07	0.555	22 48 41.04
Frid.	5	23 4 16.12	9.283	5 57 47.6	57.99	11 38.53	0.573	22 52 37.59
Sat.	6	23 7 58.71	9.266	5 34 33.5	58.18	11 24.57	0.590	22 56 34.14
SUN.	7	23 11 40.89	9.249	5 11 15.0	+58.36	11 10.19	0.607	23 0 30.69
Mon.	8	23 15 22.66	9.233	4 47 52.3	58.52	10 55.41	0.623	23 4 27.25
Tues.	9	23 19 4.05	9.217	4 24 25.9	58.67	10 40.25	0.639	23 8 23.80
Wed.	10	23 22 45.08	9.203	4 0 56.2	+58.80	10 24.73	0.653	23 12 20.35
Thur.	11	23 26 25.76	9.188	3 37 23.7	58.91	10 8.86	0.668	23 16 16.90
Frid.	12	23 30 6.11	9.175	3 13 48.7	59.00	9 52.66	0.681	23 20 13.45
Sat.	13	23 33 46.15	9.162	2 50 11.6	+59.08	9 36.15	0.694	23 24 10.00
SUN.	14	23 37 25.90	9.151	2 26 32.7	59.14	9 19.35	0.705	23 28 6.56
Mon.	15	23 41 5.39	9.140	2 2 52.5	59.19	9 2.28	0.716	23 32 3.11
Tues.	16	23 44 44.62	9.130	1 39 11.3	+59.23	8 44.96	0.726	23 35 59.66
Wed.	17	23 48 23.63	9.121	1 15 29.4	59.25	8 27.42	0.735	23 39 56.21
Thur.	18	23 52 2.44	9.113	0 51 47.2	59.25	8 9.68	0.743	23 43 52.76
Frid.	19	23 55 41.08	9.106	0 28 5.0	+59.25	7 51.77	0.750	23 47 49.31
Sat.	20	23 59 19.57	9.101	S. 0 4 23.3	59.23	7 33.71	0.755	23 51 45.87
SUN.	21	0 2 57.94	9.096	N. 0 19 17.7	59.19	7 15.52	0.760	23 55 42.42
Mon.	22	0 6 36.20	9.093	0 42 57.6	+59.14	6 57.23	0.763	23 59 38.97
Tues.	23	0 10 14.38	9.090	1 6 36.1	59.07	6 38.86	0.766	0 3 35.52
Wed.	24	0 13 52.51	9.088	1 30 12.9	58.99	6 20.44	0.768	0 7 32.07
Thur.	25	0 17 30.60	9.087	1 53 47.6	+58.89	6 1.98	0.769	0 11 28.62
Frid.	26	0 21 8.68	9.087	2 17 19.8	58.78	5 43.51	0.769	0 15 25.18
Sat.	27	0 24 46.79	9.088	2 40 49.1	58.66	5 25.06	0.768	0 19 21.73
SUN.	28	0 28 24.92	9.090	3 4 15.3	+58.52	5 6.64	0.766	0 23 18.28
Mon.	29	0 32 3.10	9.092	3 27 38.0	58.37	4 48.27	0.764	0 27 14.83
Tues.	30	0 35 41.35	9.096	3 50 56.9	58.20	4 29.97	0.760	0 31 11.38
Wed.	31	0 39 19.69	9.100	4 14 11.6	58.02	4 11.76	0.756	0 35 7.93
Thur.	32	0 42 58.14	9.105	N. 4 37 21.7	+57.82	3 53.65	0.751	0 39 4.49

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing.

Diff. for 1 Hour,
+ 9ˢ.8565.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	60	340 51 56.8	51 51.8	150.43	+ 0.10	9.9962618	+ 46.4	1 22 55.00
2	61	341 52 6.4	52 1.3	150.37	+ 0.02	9.9963734	46.6	1 18 59.09
3	62	342 52 14.4	52 9.2	150.30	– 0.08	9.9964855	46.8	1 15 3.18
4	63	343 52 20.7	52 15.4	150.23	– 0.20	9.9965981	+ 47.0	1 11 7.28
5	64	344 52 25.2	52 19.8	150.15	0.34	9.9967112	47.2	1 7 11.37
6	65	345 52 27.8	52 22.3	150.07	0.47	9.9968246	47.4	1 3 15.46
7	66	346 52 28.4	52 22.9	149.99	– 0.60	9.9969383	+ 47.5	0 59 19.55
8	67	347 52 27.0	52 21.4	149.90	0.72	9.9970522	47.6	0 55 23.65
9	68	348 52 23.5	52 17.8	149.81	0.82	9.9971664	47.7	0 51 27.75
10	69	349 52 17.8	52 12.1	149.72	– 0.89	9.9972810	+ 47.9	0 47 31.84
11	70	350 52 10.0	52 4.2	149.63	0.94	9.9973961	48.0	0 43 35.93
12	71	351 52 0.0	51 54.1	149.54	0.95	9.9975118	48.3	0 39 40.02
13	72	352 51 47.7	51 41.7	149.44	– 0.94	9.9976281	+ 48.6	0 35 44.11
14	73	353 51 33.2	51 27.1	149.35	0.90	9.9977450	48.9	0 31 48.20
15	74	354 51 16.4	51 10.3	149.25	0.83	9.9978628	49.3	0 27 52.30
16	75	355 50 57.4	50 51.2	149.16	– 0.73	9.9979815	+ 49.6	0 23 56.40
17	76	356 50 36.2	50 29.9	149.07	0.61	9.9981011	50.0	0 20 0.50
18	77	357 50 12.7	50 6.3	148.98	0.49	9.9982216	50.4	0 16 4.59
19	78	358 49 47.1	49 40.6	148.89	– 0.35	9.9983431	+ 50.8	0 12 8.68
20	79	359 49 19.5	49 12.9	148.80	0.22	9.9984657	51.2	0 8 12.77
21	80	0 48 49.8	48 43.2	148.72	– 0.09	9.9985893	51.6	0 4 16.87
22	81	1 48 18.2	48 11.5	148.64	+ 0.02	9.9987139	+ 52.0	{ 0 0 20.96 } { 23 56 25.05 }
23	82	2 47 44.7	47 37.9	148.56	0.11	9.9988393	52.4	23 52 29.15
24	83	3 47 9.4	47 2.5	148.48	0.17	9.9989655	52.7	23 48 33.25
25	84	4 46 32.3	46 25.3	148.41	+ 0.20	9.9990922	+ 52.9	23 44 37.34
26	85	5 45 53.4	45 46.4	148.33	0.21	9.9992194	53.1	23 40 41.43
27	86	6 45 12.7	45 5.6	148.26	0.18	9.9993471	53.2	23 36 45.52
28	87	7 44 30.2	44 23 0	148.19	+ 0.13	9.9994750	+ 53.2	23 32 49.61
29	88	8 43 45.9	43 38.6	148.12	+ 0.05	9.9996028	53.1	23 28 53.70
30	89	9 42 59.9	42 52.5	148.05	– 0.05	9.9997303	53.0	23 24 57.80
31	90	10 42 12.2	42 4.8	147.97	0.18	9.9998575	52.9	23 21 1.90
32	91	11 41 22.6	41 15.7	147.89	– 0.31	9.9999843	+ 52.7	23 17 6.00

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0ᵈ.0.

Diff. for 1 Hour,
— 9ˢ.8296.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 45.9	14 44.9	54 4.4	−0.39	54 0.8	−0.22	21 39.4	1.91	25.4
2	14 44.5	14 44.6	53 59.2	−0.06	53 59.4	+0.09	22 24.9	1.87	26.4
3	14 45.0	14 46.0	54 1.2	+0.21	54 4.6	0.34	23 9.5	1.84	27.4
4	14 47.3	14 48.9	54 9.4	+0.46	54 15.5	+0.56	23 53.4	1.82	28.4
5	14 50.9	14 53.2	54 22.8	0.65	54 31.2	0.74	6		29.4
6	14 55.8	14 58.6	54 40.6	0.83	54 51.0	0.90	0 37.1	1.82	0.6
7	15 1.7	15 4.9	55 2.2	+0.97	55 14.3	+1.05	1 21.0	1.84	1.6
8	15 8.5	15 12.3	55 27.3	1.12	55 41.2	1.19	2 5.6	1.88	2.6
9	15 16.3	15 20.5	55 56.0	1.27	56 11.6	1.34	2 51.5	1.95	3.6
10	15 25.0	15 29.8	56 28.1	+1.41	56 45.5	+1.48	3 39.2	2.04	4.6
11	15 34.7	15 39.9	57 3.7	1.55	57 22.7	1.61	4 29.3	2.14	5.6
12	15 45.3	15 50.8	57 42.4	1.66	58 2.6	1.69	5 22.0	2.25	6.6
13	15 56.3	16 1.9	58 23.0	+1.71	58 43.5	+1.70	6 17.2	2 35	7.6
14	16 7.4	16 12.7	59 3.7	1.66	59 23.2	1.58	7 14.3	2.41	8.6
15	16 17.7	16 22.3	59 41.6	1.46	59 58.3	1.31	8 12.6	2.43	9.6
16	16 26.2	16 29.5	60 12.9	+1.11	60 24.8	+0.87	9 10.9	2.42	10.6
17	16 31.9	16 33.4	60 33.6	+0.59	60 39.0	+0.29	10 8.4	2.37	11.6
18	16 33.8	16 33.1	60 40.6	−0.04	60 38.1	−0.38	11 4.7	2.31	12.6
19	16 31.3	16 28.4	60 31.5	−0.72	60 20.9	−1.04	11 59.6	2.26	13.6
20	16 24.5	16 19.6	60 6.5	1.35	59 48.6	1.61	12 53.2	2.21	14.6
21	16 14.0	16 7.7	59 27.8	1.83	59 4.6	2.01	13 45.8	2.18	15.6
22	16 0.8	15 53.7	58 39.5	−2.14	58 13.2	−2.22	14 37.8	2.15	16.6
23	15 46.3	15 39.0	57 46.3	2.24	57 19.4	2.22	15 29.3	2.13	17.6
24	15 31.8	15 24.9	56 53.0	2.16	56 27.6	2.06	16 20.2	2.11	18.6
25	15 18.4	15 12.3	56 3.6	−1.93	55 41.3	−1.77	17 10.4	2.07	19.6
26	15 6.8	15 1.9	55 21.1	1.59	55 3.2	1.40	17 59.7	2.03	20.6
27	14 57.7	14 54.1	54 47.6	1.20	54 34.5	0.98	18 47.9	1.98	21.6
28	14 51.3	14 49.1	54 24.0	−0.77	54 16.1	−0.55	19 34.9	1.93	22.6
29	14 47.6	14 46.8	54 10.7	−0.35	54 7 8	−0.15	20 20.8	1.89	23.6
30	14 46.7	14 47.1	54 7.2	+0.05	54 8.8	+0.23	21 5.6	1.85	24.6
31	14 48.1	14 49.7	54 12.6	0.39	54 18.3	0.55	21 49.7	1.83	25.6
32	14 51.7	14 54.2	54 25.8	+0.69	54 34.9	+0.81	22 33.6	1.83	26.6

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 1.					**WEDNESDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 35 46.53	2.0511	S. 17 19 3.4	3.175	0	21 12 29.73	1.9798	S. 13 23 31.2	6.490
1	19 37 49.55	2.0496	17 15 50.6	3.252	1	21 14 28.48	1.9784	13 17 0.0	6.549
2	19 39 52.48	2.0482	17 12 33.2	3.329	2	21 16 27.14	1.9770	13 10 25.3	6.608
3	19 41 55.33	2.0467	17 9 11.1	3.407	3	21 18 25.72	1.9757	13 3 47.1	6.666
4	19 43 58.09	2.0452	17 5 44.4	3.483	4	21 20 24.22	1.9744	12 57 5.4	6.723
5	19 46 0.75	2.0436	17 2 13.1	3.559	5	21 22 22.65	1.9732	12 50 20.3	6.780
6	19 48 3.32	2.0421	16 58 37.3	3.635	6	21 24 21.00	1.9718	12 43 31.8	6.837
7	19 50 5.80	2.0406	16 54 56.9	3.711	7	21 26 19.27	1.9705	12 36 39.9	6.892
8	19 52 8.19	2.0392	16 51 12.0	3.786	8	21 28 17.46	1.9692	12 29 44.7	6.947
9	19 54 10.50	2.0377	16 47 22.6	3.861	9	21 30 15.58	1.9680	12 22 46.2	7.002
10	19 56 12.72	2.0362	16 43 28.7	3.936	10	21 32 13.62	1.9668	12 15 44.4	7.057
11	19 58 14.84	2.0346	16 39 30.3	4.011	11	21 34 11.59	1.9656	12 8 39.3	7.112
12	20 0 16.87	2.0331	16 35 27.4	4.085	12	21 36 9.49	1.9643	12 1 30.9	7.166
13	20 2 18.81	2.0316	16 31 20.1	4.158	13	21 38 7.31	1.9631	11 54 19.4	7.219
14	20 4 20.66	2.0301	16 27 8.4	4.231	14	21 40 5.06	1.9619	11 47 4.7	7.272
15	20 6 22.42	2.0286	16 22 52.3	4.304	15	21 42 2.74	1.9607	11 39 46.8	7.324
16	20 8 24.09	2.0270	16 18 31.9	4.377	16	21 44 0.35	1.9596	11 32 25.8	7.375
17	20 10 25.66	2.0254	16 14 7.1	4.449	17	21 45 57.89	1.9585	11 25 1.8	7.426
18	20 12 27.14	2.0239	16 9 38.0	4.521	18	21 47 55.37	1.9574	11 17 34.7	7.477
19	20 14 28.53	2.0224	16 5 4.6	4.592	19	21 49 52.78	1.9563	11 10 4.5	7.527
20	20 16 29.83	2.0209	16 0 26.9	4.664	20	21 51 50.12	1.9552	11 2 31.4	7.577
21	20 18 31.04	2.0194	15 55 44.9	4.735	21	21 53 47.40	1.9542	10 54 55.3	7.626
22	20 20 32.16	2.0178	15 50 58.7	4.805	22	21 55 44.62	1.9531	10 47 16.3	7.674
23	20 22 33.18	2.0162	S. 15 46 8.3	4.874	23	21 57 41.77	1.9520	S. 10 39 34.4	7.722
	TUESDAY 2.					**THURSDAY 4.**			
0	20 24 34.11	2.0147	S. 15 41 13.8	4.943	0	21 59 38.86	1.9510	S. 10 31 49.6	7.770
1	20 26 34.95	2.0132	15 36 15.1	5.013	1	22 1 35.89	1.9500	10 24 2.0	7.817
2	20 28 35.70	2.0117	15 31 12.2	5.082	2	22 3 32.86	1.9491	10 16 11.6	7.864
3	20 30 36.36	2.0102	15 26 5.2	5.151	3	22 5 29.78	1.9482	10 8 18.3	7.911
4	20 32 36.93	2.0087	15 20 54.1	5.219	4	22 7 26.64	1.9472	10 0 22.3	7.956
5	20 34 37.41	2.0072	15 15 38.9	5.287	5	22 9 23.44	1.9462	9 52 23.6	8.000
6	20 36 37.80	2.0057	15 10 19.7	5.354	6	22 11 20.19	1.9453	9 44 22.3	8.044
7	20 38 38.09	2.0042	15 4 56.4	5.421	7	22 13 16.88	1.9445	9 36 18.3	8.088
8	20 40 38.30	2.0027	14 59 29.2	5.487	8	22 15 13.53	1.9437	9 28 11.7	8.131
9	20 42 38.42	2.0012	14 53 58.0	5.552	9	22 17 10.13	1.9429	9 20 2.5	8.174
10	20 44 38.45	1.9997	14 48 22.9	5.617	10	22 19 6.68	1.9421	9 11 50.8	8.217
11	20 46 38.39	1.9982	14 42 43.9	5.683	11	22 21 3.18	1.9413	9 3 36.5	8.259
12	20 48 38.24	1.9967	14 37 0.9	5.748	12	22 22 59.64	1.9406	8 55 19.7	8.300
13	20 50 38.00	1.9953	14 31 14.1	5.812	13	22 24 56.06	1.9399	8 47 0.5	8.340
14	20 52 37.68	1.9939	14 25 23.5	5.876	14	22 26 52.43	1.9391	8 38 38.9	8.381
15	20 54 37.27	1.9924	14 19 29.0	5.940	15	22 28 48.75	1.9383	8 30 14.8	8.421
16	20 56 36.77	1.9910	14 13 30.7	6.003	16	22 30 45.03	1.9377	8 21 48.4	8.459
17	20 58 36.19	1.9896	14 7 28.7	6.065	17	22 32 41.28	1.9371	8 13 19.7	8.497
18	21 0 35.52	1.9881	14 1 22.9	6.127	18	22 34 37.49	1.9365	8 4 48.8	8.534
19	21 2 34.76	1.9867	13 55 13.4	6.189	19	22 36 33.66	1.9359	7 56 15.6	8.572
20	21 4 33.92	1.9853	13 49 0.2	6.250	20	22 38 29.80	1.9354	7 47 40.2	8.609
21	21 6 33.00	1.9839	13 42 43.4	6.311	21	22 40 25.91	1.9348	7 39 2.5	8.646
22	21 8 31.99	1.9825	13 36 22.9	6.372	22	22 42 21.98	1.9343	7 30 22.7	8.681
23	21 10 30.90	1.9812	13 29 58.8	6.431	23	22 44 18.03	1.9339	7 21 40.8	8.715
24	21 12 29.73	1.9798	S. 13 23 31.2	6.490	24	22 46 14.05	1.9334	S. 7 12 56.9	8.749

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 46 14.05	1.9334	S. 7 12 56.9	8.749
1	22 48 10.04	1.9330	7 4 10.9	8.783
2	22 50 6.01	1.9326	6 55 22.9	8.817
3	22 52 1.95	1.9322	6 46 32.8	8.851
4	22 53 57.87	1.9318	6 37 40.8	8.882
5	22 55 53.77	1.9316	6 28 47.0	8.913
6	22 57 49.66	1.9313	6 19 51.3	8.943
7	22 59 45.53	1.9310	6 10 53.8	8.974
8	23 1 41.38	1.9307	6 1 54.4	9.005
9	23 3 37.22	1.9305	5 52 53.2	9.034
10	23 5 33.04	1.9303	5 43 50.3	9.062
11	23 7 28.86	1.9302	5 34 45.8	9.089
12	23 9 24.67	1.9301	5 25 39.6	9.116
13	23 11 20.47	1.9300	5 16 31.8	9.143
14	23 13 16.27	1.9300	5 7 22.4	9.170
15	23 15 12.07	1.9299	4 58 11.4	9.196
16	23 17 7.86	1.9299	4 48 58.9	9.221
17	23 19 3.66	1.9300	4 39 44.9	9.245
18	23 20 59.46	1.9300	4 30 29.5	9.268
19	23 22 55.26	1.9301	4 21 12.7	9.292
20	23 24 51.07	1.9302	4 11 54.5	9.314
21	23 26 46.89	1.9304	4 2 35.0	9.336
22	23 28 42.72	1.9306	3 53 14.2	9.357
23	23 30 38.56	1.9308	S. 3 43 52.2	9.377

SATURDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 32 34.42	1.9311	S. 3 34 28.9	9.397
1	23 34 30.29	1.9313	3 25 4.5	9.417
2	23 36 26.18	1.9317	3 15 38.9	9.436
3	23 38 22.09	1.9320	3 6 12.2	9.454
4	23 40 18.02	1.9324	2 56 44.4	9.472
5	23 42 13.98	1.9329	2 47 15.6	9.488
6	23 44 9.97	1.9333	2 37 45.8	9.504
7	23 46 5.98	1.9338	2 28 15.1	9.520
8	23 48 2.02	1.9343	2 18 43.4	9.536
9	23 49 58.10	1.9349	2 9 10.8	9.550
10	23 51 54.21	1.9354	1 59 37.4	9.564
11	23 53 50.35	1.9360	1 50 3.2	9.577
12	23 55 46.53	1.9367	1 40 28.2	9.589
13	23 57 42.75	1.9374	1 30 52.5	9.601
14	23 59 39.02	1.9382	1 21 16.1	9.612
15	0 1 35.33	1.9389	1 11 39.1	9.622
16	0 3 31.69	1.9397	1 2 1.5	9.632
17	0 5 28.10	1.9405	0 52 23.3	9.642
18	0 7 24.55	1.9413	0 42 44.5	9.651
19	0 9 21.06	1.9422	0 33 5.2	9.658
20	0 11 17.62	1.9432	0 23 25.6	9.664
21	0 13 14.24	1.9442	0 13 45.6	9.670
22	0 15 10.92	1.9452	S. 0 4 5.2	9.677
23	0 17 7.66	1.9462	N. 0 5 35.6	9.682
24	0 19 4.47	1.9473	N. 0 15 16.7	9.687

SUNDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 19 4.47	1.9473	N. 0 15 16.7	9.687
1	0 21 1.34	1.9484	0 24 58.0	9.690
2	0 22 58.28	1.9496	0 34 39.5	9.693
3	0 24 55.29	1.9508	0 44 21.2	9.696
4	0 26 52.37	1.9520	0 54 3.0	9.697
5	0 28 49.53	1.9532	1 3 44.9	9.698
6	0 30 46.76	1.9545	1 13 26.8	9.698
7	0 32 44.07	1.9558	1 23 8.7	9.698
8	0 34 41.46	1.9572	1 32 50.6	9.697
9	0 36 38.94	1.9587	1 42 32.4	9.696
10	0 38 36.51	1.9602	1 52 14.1	9.694
11	0 40 34.16	1.9616	2 1 55.6	9.691
12	0 42 31.90	1.9632	2 11 37.0	9.687
13	0 44 29.74	1.9647	2 21 18.1	9.682
14	0 46 27.67	1.9662	2 30 58.9	9.677
15	0 48 25.69	1.9678	2 40 39.3	9.671
16	0 50 23.81	1.9695	2 50 19.4	9.664
17	0 52 22.03	1.9712	2 59 59.0	9.657
18	0 54 20.36	1.9730	3 9 38.2	9.649
19	0 56 18.79	1.9748	3 19 16.9	9.640
20	0 58 17.33	1.9766	3 28 55.0	9.630
21	1 0 15.98	1.9785	3 38 32.5	9.620
22	1 2 14.75	1.9804	3 48 9.4	9.610
23	1 4 13.63	1.9823	N. 3 57 45.7	9.599

MONDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 6 12.62	1.9842	N. 4 7 21.3	9.586
1	1 8 11.73	1.9862	4 16 56.1	9.572
2	1 10 10.97	1.9883	4 26 30.0	9.558
3	1 12 10.33	1.9904	4 36 3.1	9.544
4	1 14 9.82	1.9926	4 45 35.3	9.528
5	1 16 9.44	1.9947	4 55 6.5	9.512
6	1 18 9.18	1.9968	5 4 36.8	9.496
7	1 20 9.06	1.9991	5 14 6.0	9.478
8	1 22 9.07	2.0013	5 23 34.1	9.460
9	1 24 9.22	2.0036	5 33 1.2	9.442
10	1 26 9.50	2.0059	5 42 27.1	9.422
11	1 28 9.93	2.0083	5 51 51.8	9.401
12	1 30 10.50	2.0107	6 1 15.2	9.379
13	1 32 11.22	2.0132	6 10 37.3	9.357
14	1 34 12.08	2.0156	6 19 58.1	9.335
15	1 36 13.09	2.0182	6 29 17.5	9.311
16	1 38 14.26	2.0207	6 38 35.4	9.287
17	1 40 15.58	2.0233	6 47 51.9	9.262
18	1 42 17.06	2.0260	6 57 6.9	9.236
19	1 44 18.70	2.0287	7 6 20.3	9.209
20	1 46 20.50	2.0313	7 15 32.0	9.182
21	1 48 22.46	2.0341	7 24 42.1	9.154
22	1 50 24.59	2.0368	7 33 50.5	9.125
23	1 52 26.88	2.0396	7 42 57.1	9.094
24	1 54 29.34	2.0424	N. 7 52 1.8	9.063

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 54 29.34	2.0424	N. 7 52 1.8	9.063
1	1 56 31.97	2.0453	8 1 4.7	9.032
2	1 58 34.78	2.0482	8 10 5.7	9.001
3	2 0 37.76	2.0512	8 19 4.8	8.968
4	2 2 40.92	2.0542	8 28 1.9	8.934
5	2 4 44.26	2.0572	8 36 56.9	8.900
6	2 6 47.78	2.0602	8 45 49.9	8.865
7	2 8 51.48	2.0633	8 54 40.7	8.829
8	2 10 55.37	2.0664	9 3 29.3	8.792
9	2 12 59.45	2.0696	9 12 15.7	8.754
10	2 15 3.72	2.0727	9 20 59.8	8.715
11	2 17 8.18	2.0759	9 29 41.5	8.676
12	2 19 12.83	2.0792	9 38 20.9	8.637
13	2 21 17.68	2.0824	9 46 57.9	8.595
14	2 23 22.72	2.0857	9 55 32.3	8.553
15	2 25 27.96	2.0890	10 4 4.2	8.510
16	2 27 33.40	2.0923	10 12 33.5	8.467
17	2 29 39.04	2.0957	10 21 0.2	8.422
18	2 31 44.89	2.0992	10 29 24.2	8.377
19	2 33 50.95	2.1027	10 37 45.5	8.332
20	2 35 57.21	2.1061	10 46 4.0	8.285
21	2 38 3.68	2.1096	10 54 19.7	8.237
22	2 40 10.36	2.1131	11 2 32.5	8.189
23	2 42 17.25	2.1167	N.11 10 42.4	8.140

WEDNESDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	2 44 24.36	2.1202	N.11 18 49.3	8.089
1	2 46 31.68	2.1238	11 26 53.1	8.038
2	2 48 39.22	2.1275	11 34 53.9	7.987
3	2 50 46.98	2.1312	11 42 51.6	7.935
4	2 52 54.96	2.1348	11 50 46.1	7.881
5	2 55 3.16	2.1385	11 58 37.3	7.827
6	2 57 11.58	2.1422	12 6 25.3	7.772
7	2 59 20.23	2.1460	12 14 9.9	7.716
8	3 1 29.10	2.1498	12 21 51.2	7.659
9	3 3 38.20	2.1536	12 29 29.0	7.601
10	3 5 47.53	2.1574	12 37 3.3	7.542
11	3 7 57.09	2.1612	12 44 34.1	7.483
12	3 10 6.88	2.1651	12 52 1.3	7.423
13	3 12 16.90	2.1690	12 59 24.9	7.362
14	3 14 27.16	2.1729	13 6 44.8	7.300
15	3 16 37.65	2.1768	13 14 0.9	7.237
16	3 18 48.37	2.1807	13 21 13.2	7.173
17	3 20 59.33	2.1847	13 28 21.7	7.109
18	3 23 10.53	2.1887	13 35 26.3	7.043
19	3 25 21.97	2.1926	13 42 26.9	6.977
20	3 27 33.64	2.1965	13 49 23.6	6.911
21	3 29 45.55	2.2005	13 56 16.2	6.843
22	3 31 57.70	2.2045	14 3 4.7	6.774
23	3 34 10.09	2.2086	14 9 49.1	6.704
24	3 36 22.73	2.2127	N.14 16 29.2	6.633

THURSDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 36 22.73	2.2127	N.14 16 29.2	6.633
1	3 38 35.61	2.2167	14 23 5.1	6.562
2	3 40 48.73	2.2207	14 29 36.7	6.490
3	3 43 2.09	2.2247	14 36 3.9	6.417
4	3 45 15.70	2.2288	14 42 26.7	6.342
5	3 47 29.55	2.2329	14 48 45.0	6.267
6	3 49 43.65	2.2370	14 54 58.8	6.192
7	3 51 57.99	2.2411	15 1 8.0	6.115
8	3 54 12.58	2.2452	15 7 12.6	6.038
9	3 56 27.41	2.2492	15 13 12.6	5.961
10	3 58 42.48	2.2533	15 19 7.9	5.882
11	4 0 57.80	2.2574	15 24 58.4	5.801
12	4 3 13.37	2.2615	15 30 44.0	5.719
13	4 5 29.18	2.2656	15 36 24.7	5.638
14	4 7 45.24	2.2697	15 42 0.6	5.556
15	4 10 1.55	2.2738	15 47 31.5	5.473
16	4 12 18.10	2.2778	15 52 57.4	5.389
17	4 14 34.89	2.2819	15 58 18.2	5.304
18	4 16 51.93	2.2860	16 3 33.9	5.218
19	4 19 9.21	2.2901	16 8 44.4	5.132
20	4 21 26.74	2.2942	16 13 49.7	5.044
21	4 23 44.51	2.2982	16 18 49.7	4.956
22	4 26 2.52	2.3022	16 23 44.4	4.867
23	4 28 20.78	2.3063	N.16 28 33.7	4.777

FRIDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	4 30 39.28	2.3103	N.16 33 17.7	4.687
1	4 32 58.02	2.3143	16 37 56.2	4.595
2	4 35 17.00	2.3182	16 42 29.1	4.502
3	4 37 36.21	2.3222	16 46 56.5	4.410
4	4 39 55.66	2.3262	16 51 18.3	4.316
5	4 42 15.35	2.3302	16 55 34.4	4.221
6	4 44 35.28	2.3341	16 59 44.8	4.125
7	4 46 55.44	2.3379	17 3 49.4	4.029
8	4 49 15.83	2.3418	17 7 48.3	3.933
9	4 51 36.46	2.3457	17 11 41.4	3.836
10	4 53 57.32	2.3496	17 15 28.6	3.737
11	4 56 18.41	2.3534	17 19 9.8	3.637
12	4 58 39.72	2.3571	17 22 45.0	3.537
13	5 1 1.26	2.3608	17 26 14.2	3.437
14	5 3 23.02	2.3646	17 29 37.4	3.336
15	5 5 45.01	2.3683	17 32 54.5	3.233
16	5 8 7.22	2.3720	17 36 5.4	3.130
17	5 10 29.65	2.3756	17 39 10.1	3.027
18	5 12 52.29	2.3792	17 42 8.7	2.924
19	5 15 15.15	2.3828	17 45 1.0	2.818
20	5 17 38.22	2.3864	17 47 46.9	2.712
21	5 20 1.51	2.3899	17 50 26.5	2.606
22	5 22 25.01	2.3933	17 52 59.7	2.499
23	5 24 48.71	2.3967	17 55 26.4	2.392
24	5 27 12.61	2.4001	N.17 57 46.7	2.284

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	5 27 12.61	2.4001	N.17 57 46.7	2.284
1	5 29 36.72	2.4035	18 0 0.5	2.175
2	5 32 1.03	2.4068	18 2 7.7	2.066
3	5 34 25.53	2.4100	18 4 8.4	1.957
4	5 36 50.23	2.4133	18 6 2.5	1.846
5	5 39 15.12	2.4165	18 7 49.9	1.735
6	5 41 40.21	2.4197	18 9 30.7	1.624
7	5 44 5.48	2.4226	18 11 4.8	1.511
8	5 46 30.94	2.4258	18 12 32.1	1.398
9	5 48 56.58	2.4288	18 13 52.6	1.285
10	5 51 22.40	2.4317	18 15 6.3	1.172
11	5 53 48.39	2.4346	18 16 13.2	1.057
12	5 56 14.55	2.4374	18 17 13.2	0.942
13	5 58 40.88	2.4403	18 18 6.3	0.827
14	6 1 7.38	2.4431	18 18 52.5	0.712
15	6 3 34.05	2.4458	18 19 31.7	0.596
16	6 6 0.88	2.4484	18 20 4.0	0.480
17	6 8 27.86	2.4510	18 20 29.3	0.363
18	6 10 55.00	2.4536	18 20 47.5	0.245
19	6 13 22.29	2.4560	18 20 58.7	0.127
20	6 15 49.72	2.4584	18 21 2.8	+ 0.009
21	6 18 17.30	2.4608	18 20 59.8	− 0.109
22	6 20 45.02	2.4631	18 20 49.7	0.228
23	6 23 12.87	2.4653	N.18 20 32.5	0.347

SUNDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	6 25 40.86	2.4676	N.18 20 8.1	0.467
1	6 28 8.98	2.4697	18 19 36.5	0.586
2	6 30 37.22	2.4718	18 18 57.8	0.705
3	6 33 5.59	2.4738	18 18 11.9	0.826
4	6 35 34.08	2.4757	18 17 18.7	0.946
5	6 38 2.68	2.4777	18 16 18.3	1.067
6	6 40 31.40	2.4796	18 15 10.7	1.187
7	6 43 0.23	2.4813	18 13 55.8	1.308
8	6 45 29.16	2.4829	18 12 33.7	1.429
9	6 47 58.18	2.4845	18 11 4.3	1.551
10	6 50 27.30	2.4862	18 9 27.6	1.672
11	6 52 56.52	2.4878	18 7 43.6	1.793
12	6 55 25.83	2.4892	18 5 52.4	1.914
13	6 57 55.22	2.4905	18 3 53.9	2.036
14	7 0 24.69	2.4918	18 1 48.1	2.159
15	7 2 54.24	2.4932	17 59 34.9	2.281
16	7 5 23.87	2.4943	17 57 14.4	2.402
17	7 7 53.56	2.4954	17 54 46.7	2.523
18	7 10 23.32	2.4965	17 52 11.7	2.644
19	7 12 53.14	2.4975	17 49 29.4	2.766
20	7 15 23.02	2.4984	17 46 39.8	2.887
21	7 17 52.95	2.4993	17 43 42.9	3.009
22	7 20 22.94	2.5001	17 40 38.7	3.131
23	7 22 52.97	2.5008	17 37 27.2	3.252
24	7 25 23.04	2.5015	N.17 34 8.5	3.372

MONDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	7 25 23.04	2.5015	N.17 34 8.5	3.372
1	7 27 53.15	2.5021	17 30 42.6	3.493
2	7 30 23.29	2.5026	17 27 9.4	3.614
3	7 32 53.46	2.5031	17 23 28.9	3.735
4	7 35 23.66	2.5036	17 19 41.2	3.854
5	7 37 53.89	2.5040	17 15 46.4	3.973
6	7 40 24.14	2.5042	17 11 44.4	4.093
7	7 42 54.40	2.5044	17 7 35.2	4.212
8	7 45 24.67	2.5046	17 3 18.9	4.332
9	7 47 54.95	2.5047	16 58 55.4	4.451
10	7 50 25.24	2.5048	16 54 24.8	4.568
11	7 52 55.53	2.5048	16 49 47.2	4.685
12	7 55 25.81	2.5047	16 45 2.6	4.802
13	7 57 56.09	2.5045	16 40 10.9	4.920
14	8 0 26.35	2.5042	16 35 12.2	5.037
15	8 2 56.60	2.5040	16 30 6.5	5.153
16	8 5 26.83	2.5037	16 24 53.9	5.268
17	8 7 57.04	2.5033	16 19 34.3	5.384
18	8 10 27.23	2.5029	16 14 7.8	5.499
19	8 12 57.39	2.5024	16 8 34.4	5.613
20	8 15 27.52	2.5018	16 2 54.2	5.726
21	8 17 57.61	2.5012	15 57 7.3	5.838
22	8 20 27.67	2.5006	15 51 13.7	5.949
23	8 22 57.68	2.4999	N.15 45 13.4	6.061

TUESDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	8 25 27.65	2.4991	N.15 39 6.4	6.172
1	8 27 57.57	2.4982	15 32 52.7	6.282
2	8 30 27.44	2.4973	15 26 32.5	6.392
3	8 32 57.25	2.4964	15 20 5.7	6.501
4	8 35 27.01	2.4955	15 13 32.4	6.609
5	8 37 56.71	2.4945	15 6 52.6	6.717
6	8 40 26.35	2.4934	15 0 6.4	6.823
7	8 42 55.92	2.4923	14 53 13.9	6.928
8	8 45 25.42	2.4912	14 46 15.0	7.033
9	8 47 54.86	2.4900	14 39 9.9	7.137
10	8 50 24.22	2.4887	14 31 58.6	7.240
11	8 52 53.50	2.4873	14 24 41.1	7.342
12	8 55 22.70	2.4860	14 17 17.5	7.443
13	8 57 51.82	2.4846	14 9 47.9	7.544
14	9 0 20.85	2.4832	14 2 12.2	7.644
15	9 2 49.80	2.4817	13 54 30.6	7.742
16	9 5 18.66	2.4802	13 46 43.1	7.840
17	9 7 47.43	2.4787	13 38 49.8	7.937
18	9 10 16.11	2.4772	13 30 50.7	8.032
19	9 12 44.69	2.4755	13 22 45.9	8.127
20	9 15 13.17	2.4738	13 14 35.4	8.221
21	9 17 41.55	2.4722	13 6 19.4	8.313
22	9 20 9.83	2.4705	12 57 57.9	8.404
23	9 22 38.01	2.4687	12 49 30.9	8.495
24	9 25 6.08	2.4669	N.12 40 58.5	8.584

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 17.					**FRIDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 25 6.08	2.4669	N. 12 40 58.5	8.584	0	11 21 7.90	2.3653	N. 4 29 36.9	11.369
1	9 27 34.04	2.4651	12 32 20.8	8.672	1	11 23 29.75	2.3632	4 18 14.0	11.393
2	9 30 1.89	2.4633	12 23 37.8	8.760	2	11 25 51.48	2.3611	4 6 49.7	11.415
3	9 32 29.64	2.4615	12 14 49.6	8.846	3	11 28 13.08	2.3590	3 55 24.2	11.435
4	9 34 57.27	2.4596	12 5 56.3	8.930	4	11 30 34.56	2.3569	3 43 57.5	11.455
5	9 37 24.79	2.4577	11 56 58.0	9.014	5	11 32 55.91	2.3548	3 32 29.6	11.473
6	9 39 52.19	2.4557	11 47 54.6	9.097	6	11 35 17.14	2.3528	3 21 0.7	11.489
7	9 42 19.47	2.4537	11 38 46.3	9.178	7	11 37 38.25	2.3508	3 9 30.9	11.504
8	9 44 46.63	2.4517	11 29 33.2	9.258	8	11 39 59.24	2.3487	2 58 0.2	11.518
9	9 47 13.68	2.4498	11 20 15.3	9.337	9	11 42 20.10	2.3467	2 46 28.7	11.531
10	9 49 40.61	2.4478	11 10 52.7	9.415	10	11 44 40.84	2.3447	2 34 56.5	11.542
11	9 52 7.41	2.4457	11 1 25.5	9.491	11	11 47 1.47	2.3428	2 23 23.7	11.551
12	9 54 34.09	2.4437	10 51 53.8	9.566	12	11 49 21.98	2.3408	2 11 50.4	11.558
13	9 57 0.65	2.4416	10 42 17.6	9.640	13	11 51 42.37	2.3389	2 0 16.7	11.565
14	9 59 27.08	2.4394	10 32 37.0	9.713	14	11 54 2.65	2.3370	1 48 42.6	11.571
15	10 1 53.38	2.4373	10 22 52.0	9.785	15	11 56 22.81	2.3351	1 37 8.2	11.574
16	10 4 19.56	2.4352	10 13 2.8	9.855	16	11 58 42.86	2.3332	1 25 33.7	11.576
17	10 6 45.61	2.4331	10 3 9.4	9.923	17	12 1 2.80	2.3313	1 13 59.1	11.577
18	10 9 11.53	2.4309	9 53 12.0	9.990	18	12 3 22.62	2.3294	1 2 24.4	11.577
19	10 11 37.32	2.4287	9 43 10.6	10.057	19	12 5 42.33	2.3276	0 50 49.8	11.575
20	10 14 2.98	2.4266	9 33 5.2	10.122	20	12 8 1.93	2.3258	0 39 15.4	11.571
21	10 16 28.51	2.4244	9 22 55.9	10.186	21	12 10 21.43	2.3241	0 27 41.3	11.566
22	10 18 53.91	2.4222	9 12 42.9	10.247	22	12 12 40.82	2.3223	0 16 7.5	11.561
23	10 21 19.18	2.4201	N. 9 2 26.3	10.307	23	12 15 0.10	2.3205	N. 0 4 34.0	11.554
	THURSDAY 18.					**SATURDAY 20.**			
0	10 23 44.32	2.4179	N. 8 52 6.0	10.367	0	12 17 19.28	2.3188	S. 0 6 59.0	11.545
1	10 26 9.33	2.4157	8 41 42.2	10.425	1	12 19 38.36	2.3171	0 18 31.4	11.535
2	10 28 34.20	2.4134	8 31 15.0	10.482	2	12 21 57.33	2.3153	0 30 3.2	11.523
3	10 30 58.94	2.4112	8 20 44.4	10.538	3	12 24 16.20	2.3137	0 41 34.2	11.510
4	10 33 23.55	2.4090	8 10 10.5	10.592	4	12 26 34.97	2.3120	0 53 4.4	11.497
5	10 35 48.02	2.4068	7 59 33.4	10.643	5	12 28 53.64	2.3103	1 4 33.8	11.482
6	10 38 12.36	2.4046	7 48 53.3	10.694	6	12 31 12.21	2.3087	1 16 2.2	11.465
7	10 40 36.57	2.4024	7 38 10.1	10.744	7	12 33 30.69	2.3071	1 27 29.6	11.447
8	10 43 0.65	2.4002	7 27 24.0	10.792	8	12 35 49.07	2.3055	1 38 55.8	11.427
9	10 45 24.59	2.3979	7 16 35.0	10.839	9	12 38 7.35	2.3039	1 50 20.8	11.407
10	10 47 48.40	2.3957	7 5 43.3	10.884	10	12 40 25.54	2.3024	2 1 44.6	11.386
11	10 50 12.08	2.3935	6 54 48.9	10.928	11	12 42 43.64	2.3009	2 13 7.1	11.362
12	10 52 35.62	2.3913	6 43 51.9	10.971	12	12 45 1.65	2.2994	2 24 28.1	11.337
13	10 54 59.03	2.3891	6 32 52.4	11.012	13	12 47 19.57	2.2979	2 35 47.6	11.312
14	10 57 22.31	2.3869	6 21 50.5	11.052	14	12 49 37.40	2.2964	2 47 5.6	11.286
15	10 59 45.46	2.3847	6 10 46.2	11.091	15	12 51 55.14	2.2949	2 58 21.9	11.258
16	11 2 8.47	2.3824	5 59 39.6	11.127	16	12 54 12.79	2.2935	3 9 36.5	11.228
17	11 4 31.35	2.3802	5 48 30.9	11.162	17	12 56 30.36	2.2921	3 20 49.3	11.197
18	11 6 54.10	2.3781	5 37 20.2	11.195	18	12 58 47.84	2.2907	3 32 0.2	11.166
19	11 9 16.72	2.3759	5 26 7.5	11.228	19	13 1 5.24	2.2893	3 43 9.2	11.133
20	11 11 39.21	2.3738	5 14 52.8	11.260	20	13 3 22.56	2.2879	3 54 16.2	11.099
21	11 14 1.57	2.3717	5 3 36.3	11.289	21	13 5 39.79	2.2865	4 5 21.1	11.063
22	11 16 23.81	2.3696	4 52 18.1	11.317	22	13 7 56.94	2.2852	4 16 23.8	11.027
23	11 18 45.92	2.3674	4 40 58.3	11.343	23	13 10 14.02	2.2840	4 27 24.4	10.991
24	11 21 7.90	2.3653	N. 4 29 36.9	11.369	24	13 12 31.02	2.2827	S. 4 38 22.7	10.952

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 12 31.02	2.2827	S. 4 38 22.7	10.952
1	13 14 47.94	2.2814	4 49 18.6	10.912
2	13 17 4.79	2.2802	5 0 12.1	10.872
3	13 19 21.56	2.2789	5 11 3.2	10.830
4	13 21 38.26	2.2777	5 21 51.7	10.787
5	13 23 54.89	2.2765	5 32 37.6	10.742
6	13 26 11.44	2.2753	5 43 20.7	10.696
7	13 28 27.92	2.2742	5 54 1.1	10.650
8	13 30 44.34	2.2731	6 4 38.7	10.603
9	13 33 0.69	2.2719	6 15 13.5	10.556
10	13 35 16.97	2.2707	6 25 45.4	10.506
11	13 37 33.18	2.2696	6 36 14.2	10.455
12	13 39 49.32	2.2685	6 46 40.0	10.404
13	13 42 5.40	2.2675	6 57 2.7	10.352
14	13 44 21.42	2.2664	7 7 22.2	10.298
15	13 46 37.37	2.2653	7 17 38.5	10.244
16	13 48 53.26	2.2643	7 27 51.5	10.189
17	13 51 9.09	2.2632	7 38 1.2	10.133
18	13 53 24.85	2.2622	7 48 7.5	10.077
19	13 55 40.55	2.2612	7 58 10.4	10.018
20	13 57 56.20	2.2603	8 8 9.7	9.958
21	14 0 11.79	2.2593	8 18 5.4	9.898
22	14 2 27.32	2.2583	8 27 57.5	9.838
23	14 4 42.79	2.2573	S. 8 37 46.0	9.777

MONDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 6 58.20	2.2564	S. 8 47 30.8	9.715
1	14 9 13.56	2.2555	8 57 11.8	9.652
2	14 11 28.86	2.2546	9 6 49.0	9.587
3	14 13 44.11	2.2537	9 16 22.3	9.522
4	14 15 59.30	2.2527	9 25 51.7	9.457
5	14 18 14.44	2.2518	9 35 17.1	9.391
6	14 20 29.52	2.2509	9 44 38.6	9.324
7	14 22 44.55	2.2501	9 53 56.0	9.256
8	14 24 59.53	2.2492	10 3 9.3	9.187
9	14 27 14.46	2.2483	10 12 18.5	9.118
10	14 29 29.33	2.2475	10 21 23.5	9.048
11	14 31 44.16	2.2467	10 30 24.2	8.977
12	14 33 58.94	2.2459	10 39 20.7	8.906
13	14 36 13.67	2.2450	10 48 12.9	8.833
14	14 38 28.34	2.2441	10 57 0.7	8.760
15	14 40 42.96	2.2432	11 5 44.1	8.687
16	14 42 57.53	2.2424	11 14 23.1	8.612
17	14 45 12.05	2.2417	11 22 57.6	8.537
18	14 47 26.53	2.2409	11 31 27.6	8.462
19	14 49 40.96	2.2400	11 39 53.0	8.386
20	14 51 55.33	2.2392	11 48 13.9	8.310
21	14 54 9.66	2.2384	11 56 30.2	8.232
22	14 56 23.94	2.2376	12 4 41.8	8.154
23	14 58 38.17	2.2368	12 12 48.7	8.075
24	15 0 52.36	2.2361	S. 12 20 50.8	7.996

TUESDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 0 52.36	2.2361	S. 12 20 50.8	7.996
1	15 3 6.50	2.2353	12 28 48.2	7.917
2	15 5 20.59	2.2344	12 36 40.8	7.837
3	15 7 34.63	2.2336	12 44 28.7	7.757
4	15 9 48.62	2.2328	12 52 11.7	7.676
5	15 12 2.56	2.2320	12 59 49.8	7.593
6	15 14 16.46	2.2312	13 7 22.9	7.511
7	15 16 30.31	2.2304	13 14 51.1	7.429
8	15 18 44.11	2.2296	13 22 14.4	7.346
9	15 20 57.86	2.2287	13 29 32.7	7.263
10	15 23 11.56	2.2279	13 36 46.0	7.179
11	15 25 25.21	2.2271	13 43 54.2	7.094
12	15 27 38.81	2.2262	13 50 57.3	7.009
13	15 29 52.36	2.2254	13 57 55.3	6.924
14	15 32 5.86	2.2247	14 4 48.2	6.839
15	15 34 19.32	2.2239	14 11 36.0	6.753
16	15 36 32.73	2.2230	14 18 18.6	6.667
17	15 38 46.08	2.2221	14 24 56.0	6.581
18	15 40 59.38	2.2212	14 31 28.3	6.494
19	15 43 12.63	2.2204	14 37 55.3	6.406
20	15 45 25.83	2.2196	14 44 17.0	6.319
21	15 47 38.98	2.2187	14 50 33.5	6.231
22	15 49 52.07	2.2178	14 56 44.7	6.142
23	15 52 5.11	2.2169	S. 15 2 50.6	6.053

WEDNESDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 54 18.10	2.2160	S. 15 8 51.1	5.964
1	15 56 31.03	2.2151	15 14 46.3	5.875
2	15 58 43.91	2.2142	15 20 36.1	5.786
3	16 0 56.74	2.2133	15 26 20.6	5.697
4	16 3 9.51	2.2123	15 31 59.7	5.607
5	16 5 22.22	2.2114	15 37 33.4	5.517
6	16 7 34.88	2.2105	15 43 1.7	5.426
7	16 9 47.48	2.2095	15 48 24.5	5.335
8	16 12 0.02	2.2086	15 53 41.9	5.245
9	16 14 12.51	2.2077	15 58 53.9	5.154
10	16 16 24.94	2.2067	16 4 0.4	5.063
11	16 18 37.31	2.2056	16 9 1.4	4.972
12	16 20 49.61	2.2045	16 13 57.0	4.881
13	16 23 1.85	2.2036	16 18 47.1	4.789
14	16 25 14.04	2.2026	16 23 31.6	4.696
15	16 27 26.16	2.2015	16 28 10.6	4.604
16	16 29 38.22	2.2004	16 32 44.1	4.512
17	16 31 50.21	2.1993	16 37 12.1	4.420
18	16 34 2.14	2.1982	16 41 34.5	4.327
19	16 36 14.00	2.1972	16 45 51.4	4.235
20	16 38 25.80	2.1961	16 50 2.7	4.142
21	16 40 37.53	2.1949	16 54 8.5	4.050
22	16 42 49.19	2.1938	16 58 8.7	3.957
23	16 45 0.78	2.1927	17 2 3.4	3.865
24	16 47 12.31	2.1916	S. 17 5 52.5	3.772

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 47 12.31	2.1916	S. 17 5 52.5	3.772
1	16 49 23.77	2.1904	17 9 36.0	3.679
2	16 51 35.16	2.1892	17 13 14.0	3.587
3	16 53 46.47	2.1879	17 16 46.4	3.493
4	16 55 57.71	2.1867	17 20 13.2	3.400
5	16 58 8.88	2.1855	17 23 34.4	3.307
6	17 0 19.97	2.1842	17 26 50.1	3.215
7	17 2 30.99	2.1830	17 30 0.2	3.122
8	17 4 41.93	2.1817	17 33 4.7	3.028
9	17 6 52.80	2.1805	17 36 3.6	2.935
10	17 9 3.59	2.1792	17 38 56.9	2.842
11	17 11 14.30	2.1779	17 41 44.6	2.749
12	17 13 24.94	2.1766	17 44 26.8	2.657
13	17 15 35.50	2.1752	17 47 3.4	2.564
14	17 17 45.97	2.1738	17 49 34.4	2.471
15	17 19 56.36	2.1725	17 51 59.9	2.378
16	17 22 6.67	2.1711	17 54 19.8	2.286
17	17 24 16.89	2.1697	17 56 34.2	2.193
18	17 26 27.03	2.1682	17 58 43.0	2.100
19	17 28 37.08	2.1668	18 0 46.2	2.008
20	17 30 47.05	2.1654	18 2 43.9	1.916
21	17 32 56.93	2.1639	18 4 36.1	1.823
22	17 35 6.72	2.1625	18 6 22.7	1.731
23	17 37 16.43	2.1611	S. 18 8 3.8	1.639

FRIDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 39 26.05	2.1596	S. 18 9 39.4	1.547
1	17 41 35.58	2.1581	18 11 9.5	1.456
2	17 43 45.02	2.1565	18 12 34.1	1.364
3	17 45 54.36	2.1549	18 13 53.1	1.272
4	17 48 3.61	2.1534	18 15 6.7	1.181
5	17 50 12.77	2.1518	18 16 14.8	1.089
6	17 52 21.83	2.1502	18 17 17.4	0.998
7	17 54 30.80	2.1487	18 18 14.6	0.907
8	17 56 39.67	2.1471	18 19 6.3	0.816
9	17 58 48.45	2.1455	18 19 52.5	0.725
10	18 0 57.13	2.1438	18 20 33.3	0.635
11	18 3 5.71	2.1422	18 21 8.7	0.545
12	18 5 14.20	2.1406	18 21 38.7	0.455
13	18 7 22.59	2.1389	18 22 3.3	0.365
14	18 9 30.87	2.1372	18 22 22.5	0.275
15	18 11 39.05	2.1355	18 22 36.3	0.186
16	18 13 47.13	2.1338	18 22 44.8	0.097
17	18 15 55.11	2.1322	18 22 47.9	− 0.007
18	18 18 2.99	2.1304	18 22 45.6	+ 0.082
19	18 20 10.76	2.1287	18 22 38.0	0.171
20	18 22 18.43	2.1269	18 22 25.1	0.259
21	18 24 25.99	2.1252	18 22 6.9	0.347
22	18 26 33.45	2.1234	18 21 43.4	0.435
23	18 28 40.80	2.1217	18 21 14.7	0.523
24	18 30 48.05	2.1199	S. 18 20 40.7	0.611

SATURDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 30 48.05	2.1199	S. 18 20 40.7	0.611
1	18 32 55.19	2.1181	18 20 1.4	0.698
2	18 35 2.22	2.1162	18 19 16.9	0.785
3	18 37 9.14	2.1144	18 18 27.2	0.872
4	18 39 15.95	2.1126	18 17 32.3	0.958
5	18 41 22.65	2.1108	18 16 32.2	1.044
6	18 43 29.25	2.1091	18 15 27.0	1.130
7	18 45 35.74	2.1072	18 14 16.6	1.216
8	18 47 42.11	2.1053	18 13 1.1	1.302
9	18 49 48.37	2.1034	18 11 40.4	1.387
10	18 51 54.52	2.1016	18 10 14.6	1.472
11	18 54 0.56	2.0997	18 8 43.7	1 557
12	18 56 6.49	2.0978	18 7 7.8	1.641
13	18 58 12.30	2.0959	18 5 26.8	1.725
14	19 0 18.00	2.0941	18 3 40.8	1.809
15	19 2 23.59	2.0922	18 1 49.7	1.892
16	19 4 29.07	2.0903	17 59 53.7	1.975
17	19 6 34.43	2.0884	17 57 52.7	2.058
18	19 8 39.68	2.0865	17 55 46.7	2.141
19	19 10 44.81	2.0846	17 53 35.8	2.223
20	19 12 49.83	2.0827	17 51 20.0	2.305
21	19 14 54.74	2.0808	17 48 59.2	2.387
22	19 16 59.53	2.0789	17 46 33.5	2.468
23	19 19 4.21	2.0770	S. 17 44 3.0	2.548

SUNDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 21 8.77	2.0750	S. 17 41 27.7	2.628
1	19 23 13.21	2.0731	17 38 47.6	2.709
2	19 25 17.54	2.0712	17 36 2.6	2.790
3	19 27 21.76	2.0693	17 33 12.8	2.870
4	19 29 25.86	2.0674	17 30 18.2	2.949
5	19 31 29.85	2.0655	17 27 18.9	3.027
6	19 33 33.72	2.0636	17 24 14.9	3.106
7	19 35 37.48	2.0617	17 21 6.2	3.184
8	19 37 41.12	2.0597	17 17 52.8	3.262
9	19 39 44.64	2.0577	17 14 34.7	3.340
10	19 41 48.05	2.0558	17 11 12.0	3.417
11	19 43 51.34	2.0539	17 7 44.7	3.494
12	19 45 54.52	2.0521	17 4 12.7	3.571
13	19 47 57.59	2.0502	17 0 36.1	3.647
14	19 50 0.54	2.0482	16 56 55.0	3.722
15	19 52 3.38	2.0463	16 53 9.4	3.797
16	19 54 6.10	2.0444	16 49 19.3	3.872
17	19 56 8.71	2.0426	16 45 24.7	3.947
18	19 58 11.21	2.0407	16 41 25.6	4.022
19	20 0 13.59	2.0388	16 37 22.1	4.096
20	20 2 15.86	2.0369	16 33 14.1	4.170
21	20 4 18.02	2.0351	16 29 1.7	4.243
22	20 6 20.07	2.0332	16 24 44.9	4.316
23	20 8 22.01	2.0313	16 20 23.8	4.389
24	20 10 23.83	2.0296	S. 16 15 58.3	4.461

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 10 23.83	2.0295	S. 16 15 58.3	4.461
1	20 12 25.55	2.0277	16 11 28.5	4.539
2	20 14 27.16	2.0258	16 6 54.4	4.603
3	20 16 28.65	2.0239	16 2 16.1	4.674
4	20 18 30.03	2.0222	15 57 33.5	4.745
5	20 20 31.31	2.0204	15 52 46.7	4.815
6	20 22 32.48	2.0186	15 47 55.7	4.885
7	20 24 33.54	2.0168	15 43 0.5	4.954
8	20 26 34.49	2.0150	15 38 1.2	5.023
9	20 28 35.34	2.0132	15 32 57.7	5.092
10	20 30 36.08	2.0115	15 27 50.1	5.160
11	20 32 36.72	2.0098	15 22 38.5	5.227
12	20 34 37.26	2.0081	15 17 22.9	5.294
13	20 36 37.69	2.0063	15 12 3.2	5.361
14	20 38 38.02	2.0046	15 6 39.5	5.428
15	20 40 38.24	2.0029	15 1 11.8	5.494
16	20 42 38.36	2.0013	14 55 40.2	5.560
17	20 44 38.39	1.9997	14 50 4.6	5.626
18	20 46 38.32	1.9980	14 44 25.1	5.690
19	20 48 38.15	1.9963	14 38 41.8	5.754
20	20 50 37.88	1.9947	14 32 54.6	5.819
21	20 52 37.51	1.9931	14 27 3.5	5.883
22	20 54 37.05	1.9915	14 21 8.6	5.946
23	20 56 36.49	1.9899	S. 14 15 10.0	6.009

TUESDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	20 58 35.84	1.9884	S. 14 9 7.6	6.071
1	21 0 35.10	1.9868	14 3 1.5	6.132
2	21 2 34.26	1.9852	13 56 51.7	6.194
3	21 4 33.33	1.9837	13 50 38.2	6.255
4	21 6 32.31	1.9822	13 44 21.1	6.315
5	21 8 31.20	1.9808	13 38 0.4	6.376
6	21 10 30.01	1.9794	13 31 36.0	6.436
7	21 12 28.73	1.9779	13 25 8.1	6.495
8	21 14 27.36	1.9765	13 18 36.6	6.555
9	21 16 25.91	1.9752	13 12 1.6	6.612
10	21 18 24.38	1.9737	13 5 23.1	6.670
11	21 20 22.76	1.9723	12 58 41.2	6.727
12	21 22 21.06	1.9710	12 51 55.8	6.785
13	21 24 19.28	1.9697	12 45 7.0	6.842
14	21 26 17.43	1.9685	12 38 14.8	6.898
15	21 28 15.50	1.9672	12 31 19.3	6.953
16	21 30 13.49	1.9659	12 24 20.5	7.008
17	21 32 11.41	1.9647	12 17 18.3	7.064
18	21 34 9.25	1.9634	12 10 12.8	7.118
19	21 36 7.02	1.9622	12 3 4.1	7.172
20	21 38 4.72	1.9611	11 55 52.2	7.226
21	21 40 2.35	1.9599	11 48 37.0	7.279
22	21 41 59.91	1.9588	11 41 18.7	7.331
23	21 43 57.41	1.9578	11 33 57.3	7.383
24	21 45 54.85	1.9567	S. 11 26 32.8	7.434

WEDNESDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 45 54.85	1.9567	S. 11 26 32.8	7.434
1	21 47 52.22	1.9557	11 19 5.2	7.486
2	21 49 49.53	1.9546	11 11 34.5	7.537
3	21 51 46.77	1.9536	11 4 0.8	7.587
4	21 53 43.96	1.9527	10 56 24.1	7.636
5	21 55 41.09	1.9517	10 48 44.5	7.685
6	21 57 38.16	1.9507	10 41 1.9	7.734
7	21 59 35.18	1.9498	10 33 16.4	7.782
8	22 1 32.14	1.9489	10 25 28.0	7.830
9	22 3 29.05	1.9481	10 17 36.8	7.877
10	22 5 25.91	1.9473	10 9 42.8	7.923
11	22 7 22.72	1.9465	10 1 46.0	7.970
12	22 9 19.49	1.9457	9 53 46.4	8.016
13	22 11 16.21	1.9450	9 45 44.1	8.061
14	22 13 12.89	1.9442	9 37 39.1	8.106
15	22 15 9.52	1.9435	9 29 31.4	8.150
16	22 17 6.11	1.9429	9 21 21.1	8.194
17	22 19 2.67	1.9423	9 13 8.2	8.238
18	22 20 59.19	1.9417	9 4 52.6	8.281
19	22 22 55.67	1.9411	8 56 34.5	8.323
20	22 24 52.12	1.9406	8 48 13.9	8.364
21	22 26 48.54	1.9401	8 39 50.8	8.405
22	22 28 44.93	1.9396	8 31 25.3	8.445
23	22 30 41.29	1.9392	S. 8 22 57.4	8.486

THURSDAY, APRIL 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 32 37.63	1.9387	S. 8 14 27.0	8.526

PHASES OF THE MOON.

		d	h	m
● New Moon .	March	5	10	4.3
☽ First Quarter . . .		13	1	17.2
○ Full Moon		19	16	36.6
☾ Last Quarter. . . .		26	22	44.2

		d	h
☾ Apogee. . .	March	2	22.3
☾ Perigee.		17	14.1
☾ Apogee.		29	0.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Spica	W.	90° 45′ 19″	3096	92° 13′ 34″	3097	93° 41′ 47″	3098	95° 9′ 59″	3099
	Antares	W.	45 30 19	3202	46 56 26	3198	48 22 38	3193	49 48 55	3189
	VENUS	E.	31 29 19	3033	29 59 47	3045	28 30 30	3058	27 1 29	3073
	SUN	E.	48 8 24	3462	46 47 17	3463	45 26 11	3464	44 5 7	3465
2	Spica	W.	102 30 48	3099	103 58 59	3098	105 27 11	3098	106 55 23	3097
	Antares	W.	57 1 29	3171	58 28 13	3167	59 55 2	3163	61 21 55	3159
	SUN	E.	37 19 54	3464	35 58 50	3463	34 37 45	3462	33 16 38	3461
3	Antares	W.	68 37 33	3138	70 4 56	3135	71 32 23	3130	72 59 56	3126
	α Aquilæ	W.	30 50 55	5573	31 40 48	5359	32 33 12	5170	33 27 56	5002
	SUN	E.	26 30 31	3448	25 9 9	3445	23 47 43	3441	22 26 13	3438
7	SUN	W.	17 41 4	3263	19 5 59	3254	20 31 4	3247	21 56 18	3238
	Aldebaran	E.	63 41 0	2896	62 8 36	2889	60 36 3	2882	59 3 21	2875
	SATURN	E.	86 57 51	2912	85 25 48	2905	83 53 36	2898	82 21 15	2891
8	SUN	W.	29 4 53	3197	30 31 6	3188	31 57 29	3180	33 24 2	3171
	Aldebaran	E.	51 17 28	2837	49 43 48	2828	48 9 57	2821	46 35 56	2813
	SATURN	E.	74 37 9	2854	73 3 51	2847	71 30 24	2839	69 56 47	2831
	Pollux	E.	95 5 21	2917	93 33 24	2909	92 1 17	2901	90 28 59	2893
9	SUN	W.	40 39 32	3124	42 7 12	3115	43 35 3	3105	45 3 6	3096
	Aldebaran	E.	38 43 10	2770	37 8 3	2762	35 32 45	2753	33 57 15	2743
	SATURN	E.	62 6 9	2791	60 31 29	2783	58 56 39	2775	57 21 38	2766
	Pollux	E.	82 44 55	2852	81 11 35	2844	79 38 4	2835	78 4 22	2828
10	SUN	W.	52 26 26	3043	53 55 45	3033	55 25 17	3022	56 55 3	3011
	SATURN	E.	49 23 46	2724	47 47 38	2715	46 11 18	2706	44 34 46	2698
	Pollux	E.	70 13 17	2787	68 38 32	2779	67 3 37	2772	65 28 32	2764
11	SUN	W.	64 27 22	2953	65 58 34	2941	67 30 1	2928	69 1 44	2916
	SATURN	E.	36 29 17	2655	34 51 37	2648	33 13 47	2641	31 35 48	2635
	Pollux	E.	57 30 38	2728	55 54 35	2721	54 18 23	2714	52 42 2	2709
	Regulus	E.	93 3 45	2615	91 25 10	2604	89 46 20	2592	88 7 14	2581
12	SUN	W.	76 44 16	2852	78 17 36	2839	79 51 13	2826	81 25 7	2813
	α Arietis	W.	35 44 53	2911	37 16 58	2869	38 49 56	2831	40 23 43	2797
	Pollux	E.	44 38 41	2689	43 1 47	2689	41 24 52	2689	39 47 57	2691
	Regulus	E.	79 47 47	2522	78 7 4	2510	76 26 5	2498	74 44 49	2485
	MARS	E.	95 19 44	2408	93 36 20	2396	91 52 40	2384	90 8 43	2373
13	SUN	W.	89 19 0	2744	90 54 41	2731	92 30 40	2717	94 6 57	2704
	α Arietis	W.	48 23 7	2653	50 0 50	2629	51 39 6	2606	53 17 53	2583
	Regulus	E.	66 14 4	2422	64 31 1	2410	62 47 40	2398	61 4 2	2385
	MARS	E.	81 24 40	2313	79 38 59	2300	77 53 0	2289	76 6 44	2277
	JUPITER	E.	100 4 51	2380	98 20 48	2367	96 36 26	2355	94 51 46	2342
14	SUN	W.	102 12 56	2635	103 51 3	2621	105 29 29	2608	107 8 13	2595
	α Arietis	W.	61 39 4	2485	63 20 38	2467	65 2 37	2450	66 45 0	2433
	Aldebaran	W.	27 48 22	2318	29 33 55	2305	31 19 47	2293	33 5 57	2280
	Regulus	E.	52 21 19	2322	50 35 52	2310	48 50 7	2298	47 4 4	2286

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Spica	W.	96° 38′ 10″	3100	98° 6′ 20″	3101	99° 34′ 29″	3101	101° 2′ 38″	3100
	Antares	W.	51 15 17	3186	52 41 43	3182	54 8 14	3178	55 34 49	3174
	Venus	E.	25 32 46	3090	24 4 24	3109	22 36 25	3131	21 8 53	3158
	Sun	E.	42 44 4	3465	41 23 1	3466	40 1 59	3466	38 40 57	3465
2	Spica	W.	108 23 36	3096	109 51 51	3094	111 20 8	3091	112 48 28	3089
	Antares	W.	62 48 53	3155	64 15 56	3152	65 43 3	3148	67 10 15	3143
	Sun	E.	31 55 30	3458	30 34 19	3456	29 13 6	3454	27 51 50	3451
3	Antares	W.	74 27 34	3121	75 55 18	3117	77 23 7	3112	78 51 2	3106
	α Aquilæ	W.	34 24 50	4852	35 23 44	4718	36 24 28	4599	37 26 54	4491
	Sun	E.	21 4 39	3433	19 43 0	3430	18 21 17	3425	16 59 29	3420
7	Sun	W.	23 21 42	3231	24 47 15	3222	26 12 58	3214	27 38 50	3205
	Aldebaran	E.	57 30 30	2867	55 57 29	2859	54 24 18	2852	52 50 58	2845
	Saturn	E.	80 48 44	2883	79 16 4	2876	77 43 15	2869	76 10 17	2862
8	Sun	W.	34 50 46	3162	36 17 41	3153	37 44 47	3143	39 12 4	3134
	Aldebaran	E.	45 1 45	2805	43 27 23	2796	41 52 50	2788	40 18 6	2779
	Saturn	E.	68 23 0	2824	66 49 3	2816	65 14 56	2808	63 40 38	2799
	Pollux	E.	88 56 31	2885	87 23 53	2877	85 51 4	2869	84 18 5	2860
9	Sun	W.	46 31 21	3086	47 59 48	3075	49 28 28	3065	50 57 20	3054
	Aldebaran	E.	32 21 32	2734	30 45 37	2725	29 9 30	2715	27 33 10	2706
	Saturn	E.	55 46 26	2758	54 11 3	2750	52 35 29	2741	50 59 43	2732
	Pollux	E.	76 30 30	2820	74 56 28	2811	73 22 15	2803	71 47 51	2795
10	Sun	W.	58 25 2	3000	59 55 15	2988	61 25 43	2977	62 56 25	2965
	Saturn	E.	42 58 3	2689	41 21 9	2681	39 44 3	2672	38 6 46	2663
	Pollux	E.	63 53 17	2756	62 17 52	2749	60 42 17	2741	59 6 32	2735
11	Sun	W.	70 33 42	2904	72 5 56	2891	73 38 26	2878	75 11 13	2866
	Saturn	E.	29 57 40	2628	28 19 23	2622	26 40 58	2618	25 2 28	2616
	Pollux	E.	51 5 34	2704	49 28 59	2699	47 52 18	2695	46 15 32	2692
	Regulus	E.	86 27 53	2569	84 48 16	2558	83 8 23	2545	81 28 13	2534
12	Sun	W.	82 59 18	2799	84 33 47	2786	86 8 33	2772	87 43 37	2758
	α Arietis	W.	41 58 15	2764	43 33 30	2734	45 9 25	2705	46 45 58	2678
	Pollux	E.	38 11 5	2695	36 34 18	2701	34 57 39	2710	33 21 13	2723
	Regulus	E.	73 3 15	2473	71 21 24	2460	69 39 15	2448	67 56 48	2436
	Mars	E.	88 24 29	2361	86 39 58	2348	84 55 9	2337	83 10 3	2325
13	Sun	W.	95 43 32	2690	97 20 25	2676	98 57 37	2663	100 35 7	2649
	α Arietis	W.	54 57 11	2562	56 36 58	2542	58 17 13	2522	59 57 55	2503
	Regulus	E.	59 20 6	2373	57 35 52	2359	55 51 19	2347	54 6 28	2335
	Mars	E.	74 20 10	2264	72 33 18	2253	70 46 9	2241	68 58 42	2229
	Jupiter	E.	93 6 47	2329	91 21 30	2316	89 35 54	2304	87 50 0	2291
14	Sun	W.	108 47 15	2582	110 26 35	2569	112 6 12	2556	113 46 7	2544
	α Arietis	W.	68 27 47	2418	70 10 56	2403	71 54 27	2388	73 38 19	2374
	Aldebaran	W.	34 52 26	2968	36 39 13	2956	38 26 17	2944	40 13 39	2933
	Regulus	E.	45 17 44	2974	43 31 6	[illegible]	41 44 11	2951	39 56 59	2940

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III$^{\text{h}}$.	P. L. of Diff.	VI$^{\text{h}}$.	P. L. of Diff.	IX$^{\text{h}}$.	P. L. of Diff.
14	**Mars**	E.	67° 10′ 58″	2217	65° 22′ 56″	2205	63° 34′ 36″	2194	61° 45′ 59″	2183
	Jupiter	E.	86 3 48	2279	84 17 17	2266	82 30 28	2254	80 43 21	2241
15	**Sun**	W.	115 26 19	2532	117 6 48	2520	118 47 34	2508	120 28 36	2497
	α Arietis	W.	75 22 31	2360	77 7 3	2346	78 51 55	2334	80 37 5	2322
	Aldebaran	W.	42 1 18	2221	43 49 14	2210	45 37 27	2199	47 25 56	2188
	Regulus	E.	38 9 31	2229	36 21 47	2218	34 33 47	2208	32 45 32	2198
	Mars	E.	52 38 49	2130	50 48 36	2120	48 58 8	2111	47 7 26	2102
	Jupiter	E.	71 43 16	2183	69 54 23	2172	68 5 13	2161	66 15 47	2150
	Spica	E.	91 43 37	2239	89 56 7	2228	88 8 21	2216	86 20 18	2206
16	Aldebaran	W.	56 32 13	2140	58 22 11	2132	60 12 22	2123	62 2 46	2116
	Saturn	W.	33 22 46	2189	35 11 30	2176	37 0 33	2165	38 49 53	2155
	Mars	E.	37 50 48	2067	35 58 58	2061	34 6 59	2057	32 14 54	2055
	Jupiter	E.	57 4 43	2103	55 13 48	2094	53 22 39	2086	51 31 18	2078
	Spica	E.	77 16 16	2159	75 26 46	2150	73 37 3	2142	71 47 8	2136
17	Aldebaran	W.	71 17 27	2085	73 8 50	2080	75 0 20	2075	76 51 57	2072
	Saturn	W.	48 0 0	2116	49 50 35	2109	51 41 20	2104	53 32 13	2100
	Pollux	W.	29 21 23	2421	31 4 28	2381	32 48 30	2348	34 33 20	2320
	Jupiter	E.	42 11 50	2047	40 19 29	2042	38 27 1	2039	36 34 27	2035
	Spica	E.	62 35 6	2107	60 44 18	2103	58 53 24	2100	57 2 25	2098
18	Aldebaran	W.	86 11 2	2064	88 2 57	2064	89 54 52	2065	91 46 45	2066
	Saturn	W.	62 47 55	2088	64 39 12	2088	66 30 29	2089	68 21 45	2090
	Pollux	W.	43 25 53	2231	45 13 34	2221	47 1 30	2213	48 49 38	2206
	Spica	E.	47 46 56	2097	45 55 52	2099	44 4 52	2103	42 13 57	2107
	Antares	E.	93 36 37	2128	91 46 20	2128	89 56 4	2129	88 5 49	2130
19	**Saturn**	W.	77 37 17	2107	79 28 6	2113	81 18 46	2118	83 9 17	2125
	Pollux	W.	57 52 5	2194	59 40 41	2196	61 29 15	2198	63 17 45	2202
	Spica	E.	33 1 36	2147	31 11 48	2159	29 22 19	2174	27 33 13	2192
	Antares	E.	78 55 34	2151	77 5 52	2157	75 16 20	2165	73 26 59	2173
20	Pollux	W.	72 18 26	2233	74 6 4	2243	75 53 28	2252	77 40 38	2262
	Regulus	W.	35 46 51	2155	37 36 27	2164	39 25 49	2174	41 14 55	2186
	Mars	W.	23 26 48	2120	25 17 17	2121	27 7 44	2124	28 58 6	2130
	Antares	E.	64 23 44	2226	62 35 55	2239	60 48 25	2253	59 1 16	2268
21	Pollux	W.	86 32 17	2325	88 17 40	2339	90 2 43	2354	91 47 24	2369
	Regulus	W.	50 15 58	2249	52 3 12	2264	53 50 5	2278	55 36 37	2294
	Mars	W.	38 7 5	2177	39 56 7	2190	41 44 50	2202	43 33 14	2216
	Jupiter	W.	17 23 33	2206	19 11 52	2220	20 59 49	2235	22 47 24	2250
	Antares	E.	50 11 29	2357	48 26 52	2378	46 42 45	2399	44 59 9	2422
22	Regulus	W.	64 23 33	2373	66 7 46	2391	67 51 34	2408	69 34 57	2425
	Mars	W.	52 29 55	2291	54 16 7	2307	56 1 56	2324	57 47 20	2341
	Jupiter	W.	31 39 37	2330	33 24 53	2347	35 9 44	2364	36 54 10	2382
	Antares	E.	36 30 5	2563	34 50 19	2597	33 11 20	2635	31 33 12	2676
	Venus	E.	111 24 1	2505	109 42 55	2524	108 2 15	2543	106 22 1	2561
23	Regulus	W.	78 5 42	2514	79 46 36	2532	81 27 5	2550	83 7 9	2567

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
14	**Mars**	E.	59° 57′ 6″	2172	58° 7′ 56″	2161	56° 18′ 29″	2151	54° 28′ 47″	2140
	Jupiter	E.	78 55 55	2230	77 8 12	2218	75 20 11	2206	73 31 52	2194
15	**Sun**	W.	122 9 54	2485	123 51 28	2475	125 33 17	2465	127 15 20	2455
	α Arietis	W.	82 22 32	2311	84 8 16	2300	85 54 16	2289	87 40 31	2279
	Aldebaran	W.	49 14 41	2178	51 3 42	2168	52 52 58	2158	54 42 29	2149
	Regulus	E.	30 57 2	2189	29 8 18	2180	27 19 21	2173	25 30 13	2166
	Mars	E.	45 16 30	2094	43 25 21	2086	41 34 0	2079	39 42 29	2073
	Jupiter	E.	64 26 4	2140	62 36 6	2130	60 45 53	2120	58 55 25	2111
	Spica	E.	84 31 59	2196	82 43 25	2186	80 54 36	2176	79 5 33	2167
16	Aldebaran	W.	63 53 21	2108	65 44 8	2101	67 35 5	2095	69 26 12	2090
	Saturn	W.	40 39 28	2146	42 29 17	2137	44 19 20	2129	46 9 35	2122
	Mars	E.	30 22 45	2053	28 30 34	2053	26 38 23	2055	24 46 15	2060
	Jupiter	E.	49 39 45	2071	47 48 1	2064	45 56 7	2058	44 4 3	2052
	Spica	E.	69 57 3	2128	68 6 47	2122	66 16 22	2116	64 25 48	2111
17	Aldebaran	W.	78 43 39	2070	80 35 25	2067	82 27 15	2065	84 19 8	2064
	Saturn	W.	55 23 12	2096	57 14 17	2094	59 5 26	2091	60 56 39	2089
	Pollux	W.	36 18 50	2296	38 4 55	2276	39 51 30	2258	41 38 31	2244
	Jupiter	E.	34 41 47	2032	32 49 3	2030	30 56 16	2028	29 3 26	2027
	Spica	E.	55 11 22	2096	53 20 16	2095	51 29 9	2095	49 38 2	2096
18	Aldebaran	W.	93 38 36	2068	95 30 24	2072	97 22 7	2075	99 13 44	2080
	Saturn	W.	70 13 0	2092	72 4 12	2095	73 55 19	2098	75 46 21	2102
	Pollux	W.	50 37 56	2201	52 26 22	2197	54 14 54	2195	56 3 29	2194
	Spica	E.	40 23 9	2113	38 32 29	2119	36 41 59	2127	34 51 41	2136
	Antares	E.	86 15 36	2133	84 25 27	2136	82 35 23	2140	80 45 25	2145
19	**Saturn**	W.	84 59 38	2132	86 49 48	2141	88 39 45	2149	90 29 29	2159
	Pollux	W.	65 6 9	2207	66 54 26	2212	68 42 35	2218	70 30 36	2225
	Spica	E.	25 44 33	2211	23 56 22	2235	22 8 46	2264	20 21 54	2300
	Antares	E.	71 37 51	2182	69 48 56	2191	68 0 15	2202	66 11 51	2214
20	Pollux	W.	79 27 33	2274	81 14 11	2285	83 0 32	2298	84 46 34	2311
	Regulus	W.	43 3 44	2197	44 52 16	2210	46 40 29	2223	48 28 23	2235
	Mars	W.	30 48 20	2137	32 38 22	2146	34 28 11	2155	36 17 46	2166
	Antares	E.	57 14 30	2284	55 28 7	2300	53 42 8	2318	51 56 35	2337
21	Pollux	W.	93 31 43	2385	95 15 39	2402	96 59 11	2419	98 42 19	2436
	Regulus	W.	57 22 46	2309	59 8 32	2324	60 53 56	2341	62 38 56	2357
	Mars	W.	45 21 17	2231	47 8 59	2245	48 56 20	2260	50 43 19	2275
	Jupiter	W.	24 34 37	2266	26 21 27	2281	28 7 54	2298	29 53 57	2313
	Antares	E.	43 16 6	2447	41 33 38	2473	39 51 47	2501	38 10 35	2531
22	Regulus	W.	71 17 56	2443	73 0 30	2460	74 42 39	2478	76 24 23	2496
	Mars	W.	59 32 20	2358	61 16 55	2375	63 1 6	2392	64 44 52	2410
	Jupiter	W.	38 38 11	2399	40 21 47	2417	42 4 58	2434	43 47 44	2452
	Antares	E.	29 56 0	2721	28 19 48	2772	26 44 43	2829	25 10 53	2895
	Venus	E.	104 42 13	2580	103 2 51	2599	101 23 55	2619	99 45 26	2638
23	Regulus	W.	84 46 49	2585	86 26 4	2604	88 4 54	2621	89 43 20	2638

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
23	Mars	W.	66° 28′ 13″	2427	68° 11′ 9″	2445	69° 53′ 40″	2462	71° 35′ 46″	2480
	Jupiter	W.	45 30 5	2470	47 12 1	2487	48 53 32	2505	50 34 38	2522
	Spica	W.	24 57 42	2604	26 36 31	2612	28 15 9	2622	29 53 34	2633
	α Aquilæ	E.	73 39 55	3001	72 9 44	3029	70 40 7	3057	69 11 5	3087
	Venus	E.	98 7 23	2657	96 29 46	2678	94 52 36	2697	93 15 52	2716
24	Regulus	W.	91 21 23	2656	92 59 2	2674	94 36 17	2691	96 13 9	2707
	Mars	W.	80 0 5	2568	81 39 44	2585	83 18 59	2602	84 57 51	2620
	Jupiter	W.	58 54 0	2610	60 32 41	2628	62 10 58	2645	62 48 52	2662
	Spica	W.	38 1 36	2698	39 38 19	2713	41 14 42	2727	42 50 46	2742
	α Aquilæ	E.	61 55 17	3251	60 30 8	3288	59 5 42	3326	57 42 1	3366
	Venus	E.	85 18 40	2814	83 44 30	2833	82 10 45	2852	80 37 24	2870
	Sun	E.	123 58 33	2997	122 28 17	3016	120 58 24	3034	119 28 54	3052
25	Jupiter	W.	71 52 48	2743	73 28 31	2758	75 3 54	2772	76 38 58	2787
	Spica	W.	50 46 13	2815	52 20 22	2829	53 54 12	2843	55 27 44	2857
	Venus	E.	72 56 33	2960	71 25 30	2977	69 54 49	2994	68 24 29	3011
	Fomalhaut	E.	82 20 56	3132	80 53 25	3150	79 26 16	3168	77 59 29	3188
	Sun	E.	112 6 55	3141	110 39 35	3158	109 12 35	3174	107 45 55	3190
26	Jupiter	W.	84 29 41	2855	86 2 57	2867	87 35 58	2880	89 8 43	2891
	Spica	W.	63 11 5	2921	64 42 57	2934	66 14 33	2946	67 45 54	2957
	Venus	E.	60 57 49	3088	59 29 25	3102	58 1 18	3116	56 33 28	3129
	Fomalhaut	E.	70 51 17	3285	69 26 48	3306	68 2 43	3326	66 39 2	3347
	α Pegasi	E.	85 15 45	3169	83 48 59	3183	82 22 29	3197	80 56 16	3210
	Sun	E.	100 37 11	3264	99 12 17	3278	97 47 40	3291	96 23 18	3304
27	Spica	W.	75 19 21	3006	76 49 26	3015	78 19 20	3024	79 49 3	3031
	Antares	W.	30 37 28	3233	32 2 58	3222	33 28 41	3213	34 54 35	3206
	Venus	E.	49 18 8	3190	47 51 47	3200	46 25 38	3210	44 59 41	3220
	Fomalhaut	E.	59 46 47	3459	58 25 37	3484	57 4 55	3510	55 44 42	3537
	α Pegasi	E.	73 49 18	3281	72 24 44	3294	71 0 26	3308	69 36 24	3322
	Sun	E.	89 24 58	3360	88 1 56	3370	86 39 5	3379	85 16 25	3388
28	Spica	W.	87 15 26	3064	88 44 20	3069	90 13 7	3074	91 41 48	3078
	Antares	W.	42 5 41	3187	43 32 6	3184	44 58 34	3182	46 25 5	3180
	Venus	E.	37 52 39	3261	36 27 42	3269	35 2 54	3276	33 38 14	3282
	Fomalhaut	E.	49 11 18	3689	47 54 19	3726	46 37 59	3764	45 22 19	3805
	α Pegasi	E.	62 40 18	3394	61 17 55	3410	59 55 50	3425	58 34 2	3441
	Sun	E.	78 25 24	3424	77 3 35	3431	75 41 53	3435	74 20 16	3440
29	Antares	W.	53 38 8	3172	55 4 51	3170	56 31 36	3168	57 58 24	3166
	α Pegasi	E.	51 49 49	3533	50 30 1	3555	49 10 37	3577	47 51 38	3602
	Sun	E.	67 33 23	3456	66 12 10	3458	64 50 59	3460	63 29 50	3460
30	Antares	W.	65 13 6	3152	66 40 13	3148	68 7 25	3144	69 34 41	3139
	α Pegasi	E.	41 24 6	3760	40 8 22	3801	38 53 21	3848	37 39 8	3900
	Sun	E.	56 44 6	3458	55 22 55	3455	54 1 41	3454	52 40 25	3451
31	Antares	W.	76 52 22	3117	78 20 11	3111	79 48 7	3105	81 16 10	3100
	α Aquilæ	W.	36 4 3	4648	37 5 47	4534	38 9 9	4431	39 14 2	4339
	Sun	E.	45 53 13	3432	44 31 33	3428	43 9 48	3423	41 47 57	3418

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
23	**Mars**	W.	73° 17′ 27″	2498	74° 58′ 43″	2515	76° 39′ 35″	2533	78° 20′ 2″	2551
	Jupiter	W.	52 15 20	2540	53 55 37	2559	55 35 29	2577	57 14 56	2593
	Spica	W.	31 31 44	2644	33 9 39	2657	34 47 16	2671	36 24 35	2684
	α Aquilæ	E.	67 42 39	3117	66 14 50	3148	64 47 39	3182	63 21 8	3215
	Venus	E.	91 39 34	2736	90 3 42	2756	88 28 16	2775	86 53 15	2795
24	**Regulus**	W.	97 49 39	2725	99 25 46	2741	101 1 31	2757	102 36 55	2773
	Mars	W.	86 36 19	2637	88 14 24	2653	89 52 7	2669	91 29 29	2684
	Jupiter	W.	65 26 23	2678	67 3 32	2695	68 40 19	2711	70 16 44	2727
	Spica	W.	44 26 30	2757	46 1 55	2772	47 37 0	2786	49 11 46	2801
	α Aquilæ	E.	56 19 6	3409	54 57 0	3453	53 35 43	3499	52 15 18	3548
	Venus	E.	79 4 27	2889	77 31 54	2907	75 59 44	2925	74 27 57	2943
	Sun	E.	117 59 46	3070	116 31 0	3089	115 2 37	3106	113 34 35	3124
25	**Jupiter**	W.	78 13 43	2801	79 48 9	2815	81 22 17	2828	82 56 8	2842
	Spica	W.	57 0 58	2870	58 33 55	2883	60 6 35	2897	61 38 58	2909
	Venus	E.	66 54 30	3027	65 24 51	3043	63 55 32	3058	62 26 31	3073
	Fomalhaut	E.	76 33 5	3207	75 7 4	3225	73 41 25	3245	72 16 9	3265
	Sun	E.	106 19 34	3205	104 53 31	3221	103 27 47	3236	102 2 21	3250
26	**Jupiter**	W.	90 41 14	2901	92 13 31	2912	93 45 34	2924	95 17 23	2933
	Spica	W.	69 17 1	2967	70 47 55	2977	72 18 36	2988	73 49 4	2997
	Venus	E.	55 5 54	3142	53 38 35	3155	52 11 32	3167	50 44 43	3178
	Fomalhaut	E.	65 15 45	3369	63 52 53	3390	62 30 25	3413	61 8 23	3436
	α Pegasi	E.	79 30 19	3225	78 4 39	3239	76 39 16	3253	75 14 9	3266
	Sun	E.	94 59 11	3316	93 35 18	3327	92 11 38	3339	90 48 12	3350
27	**Spica**	W.	81 18 37	3039	82 48 2	3046	84 17 18	3052	85 46 26	3059
	Antares	W.	36 20 37	3200	37 46 46	3196	39 13 0	3192	40 39 19	3189
	Venus	E.	43 33 56	3230	42 8 22	3238	40 42 58	3247	39 17 44	3254
	Fomalhaut	E.	54 24 59	3565	53 5 46	3593	51 47 4	3623	50 28 54	3654
	α Pegasi	E.	68 12 38	3336	66 49 8	3351	65 25 55	3365	64 2 58	3379
	Sun	E.	83 53 55	3397	82 31 35	3404	81 9 23	3412	79 47 20	3418
28	**Spica**	W.	93 10 24	3082	94 38 55	3086	96 7 22	3088	97 35 46	3091
	Antares	W.	47 51 38	3178	49 18 13	3178	50 44 49	3176	52 11 27	3173
	Venus	E.	32 13 41	3288	30 49 15	3292	29 24 54	3297	28 0 39	3301
	Fomalhaut	E.	44 7 22	3850	42 53 11	3899	41 39 50	3951	40 27 22	4010
	α Pegasi	E.	57 12 32	3458	55 51 21	3476	54 30 30	3494	53 9 59	3513
	Sun	E.	72 58 45	3445	71 37 19	3448	70 15 57	3452	68 54 39	3454
29	**Antares**	W.	59 25 14	3163	60 52 7	3161	62 19 3	3158	63 46 3	3155
	α Pegasi	E.	46 33 6	3628	45 15 2	3657	43 57 29	3688	42 40 29	3723
	Sun	E.	62 8 41	3461	60 47 33	3461	59 26 25	3460	58 5 16	3459
30	**Antares**	W.	71 2 3	3135	72 29 30	3131	73 57 2	3127	75 24 39	3122
	α Pegasi	E.	36 25 48	3957	35 13 26	4022	34 2 8	4095	32 52 1	4178
	Sun	E.	51 19 6	3448	49 57 44	3445	48 36 18	3441	47 14 48	3437
31	**Antares**	W.	82 44 20	3093	84 12 38	3087	85 41 3	3082	87 9 35	3075
	α Aquilæ	W.	40 20 19	4254	41 27 54	4178	42 36 41	4108	43 46 35	4043
	Sun	E.	40 26 1	3412	39 3 58	3407	37 41 49	3400	36 19 33	3394

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to / Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	0 42 58.73	9.103	N. 4 37 25.5	+57.81	16 2.04	64.51	3 53.60	0.751
Frid.	2	0 46 37.25	9.108	5 0 30.4	57.60	16 1.76	64.53	3 35.62	0.746
Sat.	3	0 50 15.91	9.114	5 23 30.0	57.37	16 1.48	64.55	3 17.78	0.740
SUN.	4	0 53 54.72	9.121	5 46 23.9	+57.12	16 1.20	64.58	3 0.08	0.733
Mon.	5	0 57 33.70	9.128	6 9 11.8	56.86	16 0.92	64.60	2 42.55	0.726
Tues.	6	1 1 12.87	9.136	6 31 53.3	56.59	16 0.65	64.63	2 25.21	0.718
Wed.	7	1 4 52.22	9.144	6 54 28.1	+56.29	16 0.38	64.66	2 8.07	0.710
Thur.	8	1 8 31.79	9.153	7 16 55.8	56.00	16 0.11	64.70	1 51.14	0.701
Frid.	9	1 12 11.59	9.163	7 39 16.1	55.68	15 59.84	64.73	1 34.42	0.691
Sat.	10	1 15 51.62	9.173	8 1 28.7	+55.35	15 59.58	64.77	1 17.95	0.681
SUN.	11	1 19 31.92	9.184	8 23 33.1	55.00	15 59.31	64.81	1 1.74	0.670
Mon.	12	1 23 12.49	9.196	8 45 29.0	54.65	15 59.05	64.86	0 45.80	0.658
Tues.	13	1 26 53.34	9.209	9 7 16.1	+54.28	15 58.79	64.90	0 30.14	0.645
Wed.	14	1 30 34.50	9.222	9 28 54.0	53.89	15 58.53	64.95	0 14.79	0.632
Thur.	15	1 34 15.99	9.236	9 50 22.5	53.48	15 58.26	65.00	0 0.23	0.618
Frid.	16	1 37 57.82	9.250	10 11 41.2	+53.07	15 58.00	65.06	0 14.91	0.604
Sat.	17	1 41 40.02	9.266	10 32 49.7	52.63	15 57.74	65.11	0 29.22	0.588
SUN.	18	1 45 22.60	9.283	10 53 47.8	52.19	15 57.48	65.17	0 43.15	0.572
Mon.	19	1 49 5.58	9.300	11 14 35.1	+51.73	15 57.22	65.23	0 56.69	0.555
Tues.	20	1 52 48.98	9.318	11 35 11.4	51.27	15 56.96	65.29	1 9.81	0.537
Wed.	21	1 56 32.82	9.336	11 55 36.3	50.79	15 56.70	65.35	1 22.49	0.519
Thur.	22	2 0 17.11	9.355	12 15 49.6	+50.30	15 56.44	65.42	1 34.72	0.500
Frid.	23	2 4 1.86	9.375	12 35 50.8	49.79	15 56.18	65.49	1 46.50	0.480
Sat.	24	2 7 47.08	9.396	12 55 39.7	49.27	15 55.92	65.56	1 57.80	0.459
SUN.	25	2 11 32.81	9.417	13 15 15.9	+48.74	15 55.66	65.63	2 8.59	0.438
Mon.	26	2 15 19.05	9.438	13 34 39.1	48.19	15 55.41	65.70	2 18.87	0.417
Tues.	27	2 19 5.80	9.459	13 53 49.0	47.63	15 55.16	65.77	2 28.65	0.396
Wed.	28	2 22 53.07	9.481	14 12 45.4	+47.06	15 54.91	65.85	2 37.91	0.374
Thur.	29	2 26 40.88	9.503	14 31 27.8	46.47	15 54.66	65.92	2 46.63	0.352
Frid.	30	2 30 29.23	9.526	14 49 56.0	45.87	15 54.42	66.00	2 54.81	0.329
Sat.	31	2 34 18.12	9.548	N. 15 8 9.6	+45.26	15 54.18	66.07	3 2.45	0.307

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^s.18$ from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination	Diff. for 1 Hour.	Added to Mean Time.		
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	0 42 58.14	9.105	N 4 37 21.7	+57.82	3 53.65	0.751	0 39 4.49
Frid.	2	0 46 36.71	9.110	5 0 26.9	57.61	3 35.67	0.746	0 43 1.04
Sat.	3	0 50 15.41	9.116	5 23 26.8	57.38	3 17.82	0.740	0 46 57.59
SUN.	4	0 53 54.26	9.123	5 46 21.0	+57.13	3 0.12	0.733	0 50 54.14
Mon.	5	0 57 33.29	9.130	6 9 9.2	56.87	2 42.59	0.726	0 54 50.70
Tues.	6	1 1 12.50	9.138	6 31 51.0	56.60	2 25.25	0.718	0 58 47.25
Wed.	7	1 4 51.90	9.146	6 54 26.1	+56.31	2 8.10	0.710	1 2 43.80
Thur.	8	1 8 31.51	9.155	7 16 54.1	56.01	1 51.16	0.701	1 6 40.35
Frid.	9	1 12 11.35	9.165	7 39 14.7	55.69	1 34.44	0.691	1 10 36.91
Sat.	10	1 15 51.42	9.175	8 1 27.5	+55.36	1 17.96	0.681	1 14 33.46
SUN.	11	1 19 31.76	9.186	8 23 32.1	55.01	1 1.75	0.670	1 18 30.01
Mon.	12	1 23 12.37	9.198	8 45 28.3	54.66	0 45.81	0.658	1 22 26.56
Tues.	13	1 26 53.26	9.211	9 7 15.6	+54.29	0 30.14	0.645	1 26 23.12
Wed.	14	1 30 34.46	9.224	9 28 53.8	53.90	0 14.79	0.632	1 30 19.67
Thur.	15	1 34 15.99	9.238	9 50 22.5	53.49	0 0.23	0.618	1 34 16.22
Frid.	16	1 37 57.86	9.252	10 11 41.4	+53.08	0 14.91	0.604	1 38 12.77
Sat.	17	1 41 40.10	9.268	10 32 50.1	52.64	0 29.23	0.588	1 42 9.33
SUN.	18	1 45 22.72	9.284	10 53 48.4	52.20	0 43.16	0.572	1 46 5.88
Mon.	19	1 49 5.74	9.301	11 14 35.9	+51.74	0 56.70	0.555	1 50 2.44
Tues.	20	1 52 49.17	9.319	11 35 12.4	51.28	1 9.82	0.537	1 53 58.99
Wed.	21	1 56 33.04	9.337	11 55 37.5	50.80	1 22.50	0.519	1 57 55.54
Thur.	22	2 0 17.36	9.356	12 15 50.9	+50.31	1 34.73	0.500	2 1 52.09
Frid.	23	2 4 2.14	9.376	12 35 52.3	49.80	1 46.51	0.480	2 5 48.65
Sat.	24	2 7 47.39	9.397	12 55 41.3	49.28	1 57.81	0.459	2 9 45.20
SUN.	25	2 11 33.14	9.418	13 15 17.6	+48.75	2 8.61	0.438	2 13 41.75
Mon.	26	2 15 19.41	9.439	13 34 40.9	48.20	2 18.89	0.417	2 17 38.30
Tues.	27	2 19 6.19	9.460	13 53 51.0	47.64	2 28.67	0.396	2 21 34.86
Wed.	28	2 22 53.49	9.482	14 12 47.5	+47.06	2 37.93	0.374	2 25 31.41
Thur.	29	2 26 41.32	9.504	14 31 30.0	46.47	2 46.65	0.352	2 29 27.97
Frid.	30	2 30 29.69	9.527	14 49 58.2	45.87	2 54.83	0.329	2 33 24.52
Sat.	31	2 34 18.60	9.549	N. 15 8 11.9	+45.26	3 2.48	0.307	2 37 21.08

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour, $+ 9^s.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S						Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	91	11 41 22.6	41 15.1	147.89	— 0.31	9.9999843	+ 52.7	23 17 6.00
2	92	12 40 31.0	40 23.4	147.81	0.44	0.0001106	52.5	23 13 10.10
3	93	13 39 37.5	39 29.9	147.73	0.58	0.0002362	52.2	23 9 14.19
4	94	14 38 42.0	38 34.3	147.65	— 0.69	0.0003611	+ 51.9	23 5 18.29
5	95	15 37 44.5	37 36.7	147.56	0.79	0.0004851	51.5	23 1 22.38
6	96	16 36 44.9	36 37.0	147.47	0.88	0.0006083	51.2	22 57 26.47
7	97	17 35 43.1	35 35.1	147.38	— 0.94	0.0007307	+ 50.9	22 53 30.56
8	98	18 34 39.1	34 31.0	147.29	0.96	0.0008524	50.6	22 49 34.66
9	99	19 33 32.8	33 24.6	147.20	0.95	0.0009734	50.3	22 45 38.75
10	100	20 32 24.2	32 16.0	147.10	— 0.91	0.0010939	+ 50.1	22 41 42.84
11	101	21 31 13.3	31 5.0	147.01	0.84	0.0012139	49.9	22 37 46.93
12	102	22 30 0.2	29 51.8	146.91	0.75	0.0013334	49.7	22 33 51.03
13	103	23 28 44.9	28 36.4	146.82	— 0.63	0.0014525	+ 49.6	22 29 55.13
14	104	24 27 27.3	27 18.7	146.72	0.50	0.0015713	49.5	22 25 59.22
15	105	25 26 7.5	25 58.8	146.63	0.37	0.0016900	49.5	22 22 3.31
16	106	26 24 45.5	24 36.7	146.54	— 0.24	0.0018086	+ 49.5	22 18 7.40
17	107	27 23 21.4	23 12.5	146.46	— 0.11	0.0019271	49.5	22 14 11.50
18	108	28 21 55.4	21 46.4	146.38	+ 0.02	0.0020456	49.5	22 10 15.59
19	109	29 20 27.4	20 18.3	146.30	+ 0.12	0.0021641	+ 49.4	22 6 19.68
20	110	30 18 57.6	18 48.4	146.22	0.19	0.0022825	49.3	22 2 23.77
21	111	31 17 26.0	17 16.7	146.15	0.23	0.0024007	49.2	21 58 27.87
22	112	32 15 52.7	15 43.3	146.08	+ 0.24	0.0025186	+ 49.1	21 54 31.96
23	113	33 14 17.7	14 8.2	146.01	0.23	0.0026362	48.9	21 50 36.05
24	114	34 12 41.0	12 31.4	145.94	0.19	0.0027533	48.7	21 46 40.14
25	115	35 11 2.8	10 53.1	145.87	+ 0.11	0.0028698	+ 48.4	21 42 44.23
26	116	36 9 23.1	9 13.3	145.81	+ 0.01	0.0029856	48.0	21 38 48.32
27	117	37 7 41.8	7 31.9	145.74	— 0.11	0.0031004	47.6	21 34 52.41
28	118	38 5 59.0	5 49.0	145.68	— 0.24	0.0032141	+ 47.1	21 30 56.51
29	119	39 4 14.7	4 4.6	145.62	0.37	0.0033265	46.5	21 27 0.61
30	120	40 2 28.9	2 18.6	145.56	0.50	0.0034374	45.9	21 23 4.71
31	121	41 0 41.5	0 31.1	145.49	— 0.62	0.0035468	+ 45.3	21 19 8.80

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January $0^d.0$.

Diff. for 1 Hour,
— $9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 51.7	14 54.2	54 25.8	+0.69	54 34.9	+0.81	22 33.6	1.83	26.6
2	14 57.1	15 0.2	54 45.3	0.92	54 56.9	1.01	23 17.6	1.85	27.6
3	15 3.6	15 7.3	55 9.5	1.08	55 22.8	1.14	6		28.6
4	15 11.1	15 15.0	55 36.8	+1.18	55 51.2	+1.21	0 2.3	1.89	29.6
5	15 19.0	15 23.0	56 5.9	1.23	56 20.7	1.24	0 48.4	1.95	0.9
6	15 27.1	15 31.1	56 35.6	1.24	56 50.5	1.24	1 36.2	2.04	1.9
7	15 35.1	15 39.1	57 5.3	+1.23	57 19.9	+1.21	2 26.1	2.13	2.9
8	15 43.1	15 47.0	57 34.4	1.20	57 48.6	1 18	3 18.5	2.23	3.9
9	15 50.8	15 54.5	58 2.6	1.15	58 16.3	1.13	4 13.0	2.31	4.9
10	15 58.1	16 1.6	58 29.6	+1.09	58 42.5	+1.05	5 9.0	2.36	5.9
11	16 5.0	16 8.1	58 54.8	1.00	59 6.4	0.93	6 5.8	2.36	6.9
12	16 11.0	16 13.6	59 17.0	0.84	59 26.5	0.73	7 2.5	2.35	7.9
13	16 15.8	16 17.6	59 34.6	+0.61	59 41.1	+0.46	7 58.4	2.31	8.9
14	16 18.8	16 19.4	59 45.6	+0.28	59 47.9	+0.09	8 53.2	2.26	9.9
15	16 19.4	16 18.7	59 47.8	−0.12	59 45.1	−0.34	9 46.9	2.21	10.9
16	16 17.2	16 15.0	59 39.7	−0.57	59 31.5	−0.80	10 39.7	2.18	11.9
17	16 12.0	16 8.3	59 20.5	1.02	59 6.9	1.23	11 31.9	2.17	12.9
18	16 3.9	15 59.0	58 50.9	1.42	58 32.8	1.58	12 24.0	2.17	13.9
19	15 53.6	15 47.8	58 12.9	−1.71	57 51.7	−1.81	13 16.0	2.17	14.9
20	15 41.8	15 35.6	57 29.5	1.87	57 6.9	1.88	14 8.0	2.16	15.9
21	15 29.5	15 23.4	56 44.3	1.86	56 22.2	1.81	14 59.6	2.13	16.9
22	15 17.6	15 12.2	56 0.9	−1.73	55 40.8	−1.61	15 50.4	2.09	17.9
23	15 7.1	15 2.6	55 22.2	1.47	55 5.5	1.31	16 40.1	2.04	18.9
24	14 58.6	14 55.2	54 50.9	1.12	54 38.6	0.93	17 28.3	1.98	19.9
25	14 52.5	14 50.5	54 28.7	−0.73	54 21.2	−0.51	18 15.0	1.91	20.9
26	14 49.2	14 48.6	54 16.4	−0.29	54 14.2	−0.08	19 0.3	1.86	21.9
27	14 48.7	14 49.5	54 14.6	+0.14	54 17.5	+0.35	19 44.6	1.83	22.9
28	14 51.0	14 53.0	54 22.9	+0.54	54 30.6	+0.73	20 28.3	1.82	23.9
29	14 55.7	14 58.9	54 40.4	0.90	54 52.1	1.06	21 12.0	1.83	24.9
30	15 2.6	15 6.7	55 5.7	1.20	55 20.8	1.31	21 56.4	1.87	25.9
31	15 11.1	15 15.8	55 37.0	+1.39	55 54.2	+1.46	22 42.1	1.94	26.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 1.					**SATURDAY 3.**				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 32 37.63	1.9387	S. 8 14 27.0	8.526	0	0 5 47.58	1.9561	S. 0 50 11.9	9.755
1	22 34 33.94	1.9383	8 5 54.3	8.564	1	0 7 44.98	1.9573	0 40 26.3	9.765
2	22 36 30.23	1.9379	7 57 19.3	8.602	2	0 9 42.45	1.9585	0 30 40.1	9.774
3	22 38 26.49	1.9375	7 48 42.0	8.641	3	0 11 40.00	1.9598	0 20 53.4	9.783
4	22 40 22.73	1.9373	7 40 2.4	8.679	4	0 13 37.63	1.9611	0 11 6.1	9.792
5	22 42 18.96	1.9371	7 31 20.5	8.717	5	0 15 35.34	1.9624	S. 0 1 18.4	9.799
6	22 44 15.18	1.9368	7 22 36.4	8.753	6	0 17 33.12	1.9638	N. 0 8 29.8	9.806
7	22 46 11.38	1.9366	7 13 50.2	8.788	7	0 19 30.99	1.9652	0 18 18.4	9.812
8	22 48 7.57	1.9364	7 5 1.9	8.823	8	0 21 28.95	1.9667	0 28 7.3	9.817
9	22 50 3.74	1.9362	6 56 11.4	8.858	9	0 23 26.99	1.9681	0 37 56.5	9.822
10	22 51 59.91	1.9361	6 47 18.9	8.893	10	0 25 25.12	1.9696	0 47 46.0	9.826
11	22 53 56.07	1.9359	6 38 24.3	8.926	11	0 27 23.35	1.9712	0 57 35.7	9.829
12	22 55 52.22	1.9358	6 29 27.7	8.959	12	0 29 21.67	1.9728	1 7 25.5	9.832
13	22 57 48.37	1.9358	6 20 29.2	8.992	13	0 31 20.09	1.9745	1 17 15.5	9.834
14	22 59 44.52	1.9359	6 11 28.7	9.024	14	0 33 18.61	1.9762	1 27 5.6	9.835
15	23 1 40.68	1.9360	6 2 26.3	9.056	15	0 35 17.23	1.9778	1 36 55.7	9.835
16	23 3 36.84	1.9360	5 53 22.0	9.087	16	0 37 15.95	1.9796	1 46 45.8	9.834
17	23 5 33.00	1.9361	5 44 15.9	9.117	17	0 39 14.78	1.9813	1 56 35.8	9.833
18	23 7 29.17	1.9362	5 35 8.0	9.147	18	0 41 13.71	1.9831	2 6 25.8	9.832
19	23 9 25.35	1.9364	5 25 58.3	9.176	19	0 43 12.75	1.9850	2 16 15.6	9.829
20	23 11 21.54	1.9366	5 16 46.9	9.204	20	0 45 11.91	1.9869	2 26 5.2	9.826
21	23 13 17.74	1.9368	5 7 33.8	9.232	21	0 47 11.18	1.9888	2 35 54.7	9.822
22	23 15 13.96	1.9371	4 58 19.1	9.259	22	0 49 10.57	1.9907	2 45 43.9	9.817
23	23 17 10.19	1.9374	S. 4 49 2.7	9.286	23	0 51 10.07	1.9927	N. 2 55 32.7	9.811
FRIDAY 2.					**SUNDAY 4.**				
0	23 19 6.44	1.9377	S. 4 39 44.7	9.312	0	0 53 9.69	1.9947	N. 3 5 21.2	9.805
1	23 21 2.71	1.9381	4 30 25.2	9.337	1	0 55 9.43	1.9967	3 15 9.3	9.797
2	23 22 59.01	1.9385	4 21 4.2	9.363	2	0 57 9.30	1.9988	3 24 56.9	9.789
3	23 24 55.33	1.9389	4 11 41.6	9.388	3	0 59 9.29	2.0009	3 34 44.0	9.780
4	23 26 51.68	1.9394	4 2 17.6	9.412	4	1 1 9.41	2.0031	3 44 30.5	9.771
5	23 28 48.06	1.9399	3 52 52.2	9.435	5	1 3 9.66	2.0053	3 54 16.5	9.761
6	23 30 44.47	1.9404	3 43 25.4	9.457	6	1 5 10.05	2.0076	4 4 1.8	9.749
7	23 32 40.91	1.9410	3 33 57.3	9.479	7	1 7 10.57	2.0098	4 13 46.4	9.738
8	23 34 37.39	1.9417	3 24 27.9	9.500	8	1 9 11.23	2.0121	4 23 30.3	9.726
9	23 36 33.91	1.9423	3 14 57.3	9.521	9	1 11 12.02	2.0144	4 33 13.5	9.713
10	23 38 30.47	1.9430	3 5 25.4	9.542	10	1 13 12.95	2.0167	4 42 55.8	9.698
11	23 40 27.07	1.9437	2 55 52.3	9.561	11	1 15 14.02	2.0191	4 52 37.2	9.682
12	23 42 23.71	1.9444	2 46 18.1	9.580	12	1 17 15.24	2.0216	5 2 17.6	9.665
13	23 44 20.40	1.9452	2 36 42.7	9.598	13	1 19 16.61	2.0240	5 11 57.0	9.649
14	23 46 17.14	1.9460	2 27 6.3	9.615	14	1 21 18.12	2.0264	5 21 35.4	9.632
15	23 48 13.92	1.9468	2 17 28.9	9.632	15	1 23 19.78	2.0289	5 31 12.8	9.614
16	23 50 10.76	1.9477	2 7 50.5	9.648	16	1 25 21.59	2.0315	5 40 49.1	9.595
17	23 52 7.65	1.9487	1 58 11.1	9.664	17	1 27 23.56	2.0341	5 50 24.2	9.575
18	23 54 4.60	1.9496	1 48 30.8	9.679	18	1 29 25.68	2.0367	5 59 58.1	9.554
19	23 56 1.60	1.9506	1 38 49.6	9.693	19	1 31 27.96	2.0393	6 9 30.7	9.532
20	23 57 58.67	1.9517	1 29 7.6	9.707	20	1 33 30.40	2.0420	6 19 2.0	9.510
21	23 59 55.80	1.9527	1 19 24.8	9.720	21	1 35 33.00	2.0447	6 28 31.9	9.487
22	0 1 52.99	1.9538	1 9 41.2	9.732	22	1 37 35.76	2.0474	6 38 0.4	9.462
23	0 3 50.25	1.9549	0 59 56.9	9.744	23	1 39 38.69	2.0502	6 47 27.4	9.436
24	0 5 47.58	1.9561	S. 0 50 11.9	9.755	24	1 41 41.79	2.0530	N. 6 56 52.8	9.410

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 41 41.79	2.0530	N. 6 56 52.8	9.410
1	1 43 45.05	2.0558	7 6 16.6	9.384
2	1 45 48.48	2.0587	7 15 38.9	9.357
3	1 47 52.09	2.0616	7 24 59.5	9.328
4	1 49 55.87	2.0645	7 34 18.3	9.299
5	1 51 59.83	2.0674	7 43 35.4	9.270
6	1 54 3.96	2.0703	7 52 50.7	9.239
7	1 56 8.27	2.0733	8 2 4.1	9.207
8	1 58 12.76	2.0764	8 11 15.5	9.173
9	2 0 17.44	2.0795	8 20 24.9	9.139
10	2 2 22.30	2.0825	8 29 32.2	9.105
11	2 4 27.34	2.0855	8 38 37.5	9.070
12	2 6 32.56	2.0886	8 47 40.6	9.033
13	2 8 37.97	2.0918	8 56 41.5	8.996
14	2 10 43.57	2.0950	9 5 40.2	8.958
15	2 12 49.37	2.0982	9 14 36.5	8.919
16	2 14 55.36	2.1014	9 23 30.5	8.880
17	2 17 1.54	2.1047	9 32 22.1	8.839
18	2 19 7.92	2.1080	9 41 11.2	8.797
19	2 21 14.50	2.1112	9 49 57.8	8.755
20	2 23 21.27	2.1145	9 58 41.8	8.712
21	2 25 28.24	2.1178	10 7 23.2	8.667
22	2 27 35.41	2.1212	10 16 1.9	8.622
23	2 29 42.78	2.1246	N.10 24 37.9	8.576

TUESDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	2 31 50.36	2.1280	N.10 33 11.0	8.529
1	2 33 58.14	2.1313	10 41 41.3	8.482
2	2 36 6.12	2.1347	10 50 8.8	8.433
3	2 38 14.31	2.1382	10 58 33.3	8.383
4	2 40 22.71	2.1417	11 6 54.8	8.332
5	2 42 31.32	2.1452	11 15 13.2	8.281
6	2 44 40.13	2.1486	11 23 28.5	8.228
7	2 46 49.15	2.1522	11 31 40.6	8.175
8	2 48 58.39	2.1557	11 39 49.5	8.122
9	2 51 7.84	2.1592	11 47 55.2	8.067
10	2 53 17.50	2.1627	11 55 57.5	8.010
11	2 55 27.37	2.1662	12 3 56.4	7.953
12	2 57 37 45	2.1698	12 11 51.9	7.896
13	2 59 47.75	2.1735	12 19 43.9	7.837
14	3 1 58.27	2.1771	12 27 32.3	7.777
15	3 4 9.00	2.1807	12 35 17.1	7.717
16	3 6 19.95	2.1842	12 42 58.3	7.656
17	3 8 31.11	2.1878	12 50 35.8	7.593
18	3 10 42.49	2.1915	12 58 9.5	7.530
19	3 12 54.09	2.1952	13 5 39.4	7.466
20	3 15 5.91	2.1988	13 13 5.4	7.401
21	3 17 17.95	2.2024	13 20 27.5	7.335
22	3 19 30.20	2.2060	13 27 45.6	7.268
23	3 21 42.67	2.2097	13 34 59.6	7.200
24	3 23 55.36	2.2133	N.13 42 9.6	7.132

WEDNESDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 23 55.36	2.2133	N.13 42 9.6	7.132
1	3 26 8.27	2.2170	13 49 15.5	7.062
2	3 28 21.40	2.2207	13 56 17.1	6.992
3	3 30 34.75	2.2243	14 3 14.5	6.921
4	3 32 48.32	2.2280	14 10 7.6	6.848
5	3 35 2.11	2.2316	14 16 56.3	6.775
6	3 37 16.11	2.2353	14 23 40.6	6.702
7	3 39 30.34	2.2390	14 30 20.5	6.627
8	3 41 44.79	2.2426	14 36 55.8	6.551
9	3 43 59.45	2.2462	14 43 26.6	6.475
10	3 46 14.33	2.2498	14 49 52.8	6.397
11	3 48 29.43	2.2535	14 56 14.3	6.319
12	3 50 44.75	2.2572	15 2 31.1	6.241
13	3 53 0.29	2.2608	15 8 43.2	6.161
14	3 55 16.04	2.2643	15 14 50.4	6.079
15	3 57 32.01	2.2679	15 20 52.7	5.997
16	3 59 48.19	2.2715	15 26 50.1	5.915
17	4 2 4.59	2.2751	15 32 42.5	5.832
18	4 4 21.20	2.2786	15 38 30.0	5.749
19	4 6 38.02	2.2822	15 44 12.4	5.663
20	4 8 55.06	2.2857	15 49 49.6	5.578
21	4 11 12.31	2.2892	15 55 21.7	5.492
22	4 13 29.77	2.2927	16 0 48.6	5.404
23	4 15 47.43	2.2961	N.16 6 10.2	5.316

THURSDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	4 18 5.30	2.2996	N.16 11 26.5	5.227
1	4 20 23.38	2.3030	16 16 37.4	5.137
2	4 22 41.66	2.3064	16 21 42.9	5.047
3	4 25 0.15	2.3098	16 26 43.0	4.956
4	4 27 18.84	2.3132	16 31 37.6	4.864
5	4 29 37.73	2.3165	16 36 26.6	4.771
6	4 31 56.82	2.3198	16 41 10.1	4.677
7	4 34 16.11	2.3232	16 45 47.9	4.582
8	4 36 35.60	2.3264	16 50 20.0	4.487
9	4 38 55.28	2.3296	16 54 46.4	4.392
10	4 41 15.15	2.3328	16 59 7.1	4.297
11	4 43 35.21	2.3360	17 3 22.0	4.200
12	4 45 55.47	2.3392	17 7 31.1	4.102
13	4 48 15.92	2.3423	17 11 34.3	4.003
14	4 50 36.55	2.3453	17 15 31.5	3.903
15	4 52 57.36	2.3483	17 19 22.7	3.803
16	4 55 18.35	2.3513	17 23 7.9	3.703
17	4 57 39.52	2.3543	17 26 47.0	3.602
18	5 0 0.87	2.3573	17 30 20.1	3.500
19	5 2 22.40	2.3602	17 33 47.0	3.398
20	5 4 44.10	2.3631	17 37 7.8	3.295
21	5 7 5.97	2.3659	17 40 22.4	3.191
22	5 9 28.01	2.3687	17 43 30.7	3.087
23	5 11 50.21	2.3714	17 46 32.8	2.982
24	5 14 12.58	2.3741	N.17 49 28.6	2.877

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	5 14 12.58	2.3741	N.17 49 28.6	2.877
1	5 16 35.11	2.3768	17 52 18.0	2.771
2	5 18 57.80	2.3795	17 55 1.1	2.665
3	5 21 20.65	2.3822	17 57 37.8	2.557
4	5 23 43.66	2.3847	18 0 8.0	2.449
5	5 26 6.81	2.3871	18 2 31.7	2.342
6	5 28 30.11	2.3895	18 4 49.0	2.233
7	5 30 53.55	2.3919	18 6 59.7	2.123
8	5 33 17.14	2.3943	18 9 3.8	2.014
9	5 35 40.87	2.3967	18 11 1.4	1.905
10	5 38 4.74	2.3989	18 12 52.4	1.794
11	5 40 28.74	2.4011	18 14 36.7	1.683
12	5 42 52.87	2.4032	18 16 14.4	1.572
13	5 45 17.13	2.4053	18 17 45.4	1.461
14	5 47 41.51	2.4074	18 19 9.7	1.348
15	5 50 6.02	2.4095	18 20 27.2	1.235
16	5 52 30.65	2.4114	18 21 37.9	1.122
17	5 54 55.39	2.4132	18 22 41.9	1.010
18	5 57 20.24	2.4151	18 23 39.1	0.897
19	5 59 45.20	2.4169	18 24 29.5	0.783
20	6 2 10.27	2.4187	18 25 13.0	0.668
21	6 4 35.45	2.4205	18 25 49.6	0.553
22	6 7 0.73	2.4221	18 26 19.3	0.438
23	6 9 26.10	2.4236	N.18 26 42.2	0.324

SATURDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	6 11 51.56	2.4251	N.18 26 58.2	0.209
1	6 14 17.11	2.4266	18 27 7.3	+ 0.093
2	6 16 42.75	2.4281	18 27 9.4	− 0.022
3	6 19 8.48	2.4294	18 27 4.6	0.138
4	6 21 34.28	2.4307	18 26 52.8	0.255
5	6 24 0.16	2.4320	18 26 34.0	0.371
6	6 26 26.12	2.4332	18 26 8.3	0.487
7	6 28 52.15	2.4343	18 25 35.6	0.603
8	6 31 18.24	2.4353	18 24 55.9	0.720
9	6 33 44.39	2.4363	18 24 9.2	0.837
10	6 36 10.60	2.4373	18 23 15.5	0.954
11	6 38 36.87	2.4382	18 22 14.7	1.071
12	6 41 3.19	2.4391	18 21 7.0	1.187
13	6 43 29.56	2.4399	18 19 52.3	1.304
14	6 45 55.98	2.4407	18 18 30.5	1.422
15	6 48 22.44	2.4413	18 17 1.7	1.539
16	6 50 48.94	2.4420	18 15 25.9	1.656
17	6 53 15.48	2.4426	18 13 43.0	1.773
18	6 55 42.05	2.4431	18 11 53.1	1.890
19	6 58 8.65	2.4435	18 9 56.2	2.007
20	7 0 35.27	2.4439	18 7 52.3	2.123
21	7 3 1.92	2.4443	18 5 41.4	2.240
22	7 5 28.59	2.4446	18 3 23.5	2.357
23	7 7 55.27	2.4448	18 0 58.6	2.473
24	7 10 21.97	2.4451	N.17 58 26.7	2.590

SUNDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	7 10 21.97	2.4451	N.17 58 26.7	2.590
1	7 12 48.68	2.4452	17 55 47.8	2.706
2	7 15 15.39	2.4452	17 53 2.0	2.822
3	7 17 42.10	2.4452	17 50 9.2	2.937
4	7 20 8.81	2.4452	17 47 9.5	3.053
5	7 22 35.52	2.4451	17 44 2.9	3.169
6	7 25 2.22	2.4449	17 40 49.3	3.284
7	7 27 28.91	2.4447	17 37 28.8	3.398
8	7 29 55.59	2.4445	17 34 1.5	3.513
9	7 32 22.25	2.4442	17 30 27.3	3.628
10	7 34 48.89	2.4438	17 26 46.2	3.742
11	7 37 15.51	2.4435	17 22 58.3	3.855
12	7 39 42.11	2.4431	17 19 3.6	3.968
13	7 42 8.68	2.4426	17 15 2.1	4.081
14	7 44 35.22	2.4420	17 10 53.9	4.193
15	7 47 1.72	2.4414	17 6 38.9	4.306
16	7 49 28.19	2.4408	17 2 17.2	4.417
17	7 51 54.62	2.4401	16 57 48.8	4.529
18	7 54 21.00	2.4393	16 53 13.7	4.640
19	7 56 47.34	2.4386	16 48 32.0	4.750
20	7 59 13.63	2.4378	16 43 43.7	4.860
21	8 1 39.87	2.4369	16 38 48.8	4.969
22	8 4 6.06	2.4360	16 33 47.4	5.078
23	8 6 32.19	2.4351	N.16 28 39.4	5.187

MONDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	8 8 58.27	2.4342	N.16 23 24.9	5.295
1	8 11 24.29	2.4331	16 18 4.0	5.402
2	8 13 50.24	2.4320	16 12 36.7	5.509
3	8 16 16.13	2.4309	16 7 2.9	5.616
4	8 18 41.95	2.4297	16 1 22.8	5.721
5	8 21 7.70	2.4286	15 55 36.4	5.826
6	8 23 33.38	2.4274	15 49 43.7	5.931
7	8 25 58.99	2.4262	15 43 44.7	6.034
8	8 28 24.52	2.4249	15 37 39.6	6.137
9	8 30 49.97	2.4236	15 31 28.3	6.239
10	8 33 15.35	2.4223	15 25 10.9	6.341
11	8 35 40.65	2.4209	15 18 47.4	6.442
12	8 38 5.86	2.4195	15 12 17.8	6.543
13	8 40 30.99	2.4181	15 5 42.2	6.642
14	8 42 56.03	2.4166	14 59 0.7	6.741
15	8 45 20.98	2.4151	14 52 13.3	6.839
16	8 47 45.84	2.4136	14 45 20.0	6.937
17	8 50 10.61	2.4121	14 38 20.9	7.033
18	8 52 35.29	2.4106	14 31 16.0	7.129
19	8 54 59.88	2.4090	14 24 5.4	7.224
20	8 57 24.37	2.4073	14 16 49.1	7.319
21	8 59 48.76	2.4057	14 9 27.1	7.412
22	9 2 13.05	2.4040	14 1 59.6	7.504
23	9 4 37.24	2.4024	13 54 26.6	7.596
24	9 7 1.34	2.4007	N.13 46 48.1	7.687

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 7 1.34	2.4007	N.13 46 48.1	7.687
1	9 9 25.33	2.3990	13 39 4.2	7.777
2	9 11 49.22	2.3972	13 31 14.9	7.866
3	9 14 13.00	2.3955	13 23 20.3	7.954
4	9 16 36.68	2.3938	13 15 20.4	8.042
5	9 19 0.26	2.3921	13 7 15.3	8.128
6	9 21 23.73	2.3903	12 59 5.1	8.213
7	9 23 47.09	2.3884	12 50 49.8	8.298
8	9 26 10.34	2.3867	12 42 29.4	8.382
9	9 28 33.49	2.3849	12 34 4.0	8.464
10	9 30 56.53	2.3831	12 25 33.7	8.545
11	9 33 19.46	2.3812	12 16 58.6	8.625
12	9 35 42.27	2.3793	12 8 18.7	8.704
13	9 38 4.97	2.3774	11 59 34.1	8.783
14	9 40 27.56	2.3757	11 50 44.7	8.862
15	9 42 50.05	2.3739	11 41 50.7	8.938
16	9 45 12.43	2.3720	11 32 52.2	9.013
17	9 47 34.69	2.3701	11 23 49.1	9.088
18	9 49 56.84	2.3682	11 14 41.6	9.162
19	9 52 18.88	2.3664	11 5 29.7	9.234
20	9 54 40.81	2.3646	10 56 13.5	9.305
21	9 57 2.63	2.3627	10 46 53.1	9.375
22	9 59 24.33	2.3608	10 37 28.5	9.444
23	10 1 45.92	2.3589	N.10 27 59.8	9.512

WEDNESDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 4 7.40	2.3571	N.10 18 27.1	9.579
1	10 6 28.77	2.3552	10 8 50.4	9.645
2	10 8 50.03	2.3533	9 59 9.7	9.710
3	10 11 11.17	2.3515	9 49 25.2	9.773
4	10 13 32.21	2.3497	9 39 36.9	9.836
5	10 15 53.14	2.3479	9 29 44.9	9.897
6	10 18 13.96	2.3461	9 19 49.3	9.957
7	10 20 34.67	2.3443	9 9 50.1	10.016
8	10 22 55.27	2.3425	8 59 47.4	10.074
9	10 25 15.77	2.3407	8 49 41.2	10.131
10	10 27 36.16	2.3389	8 39 31.7	10.186
11	10 29 56.44	2.3371	8 29 18.9	10.240
12	10 32 16.61	2.3353	8 19 2.9	10.293
13	10 34 36.68	2.3336	8 8 43.7	10.346
14	10 36 56.64	2.3319	7 58 21.4	10.397
15	10 39 16.50	2.3302	7 47 56.1	10.446
16	10 41 36.26	2.3285	7 37 27.9	10.494
17	10 43 55.92	2.3267	7 26 56.8	10.542
18	10 46 15.47	2.3250	7 16 22.9	10.588
19	10 48 34.92	2.3234	7 5 46.3	10.633
20	10 50 54.28	2.3218	6 55 7.0	10.676
21	10 53 13.54	2.3202	6 44 25.2	10.718
22	10 55 32.70	2.3185	6 33 40.9	10.759
23	10 57 51.76	2.3168	6 22 54.1	10.799
24	11 0 10.72	2.3152	N. 6 12 5.0	10.837

THURSDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 0 10.72	2.3152	N. 6 12 5.0	10.837
1	11 2 29.59	2.3137	6 1 13.6	10.875
2	11 4 48.37	2.3122	5 50 20.0	10.911
3	11 7 7.05	2.3106	5 39 24.3	10.946
4	11 9 25.64	2.3092	5 28 26.5	10.980
5	11 11 44.15	2.3077	5 17 26.7	11.012
6	11 14 2.57	2.3062	5 6 25.1	11.043
7	11 16 20.90	2.3047	4 55 21.6	11.073
8	11 18 39.14	2.3033	4 44 16.3	11.102
9	11 20 57.30	2.3020	4 33 9.4	11.129
10	11 23 15.38	2.3006	4 22 0.9	11.155
11	11 25 33.37	2.2992	4 10 50.8	11.180
12	11 27 51.28	2.2978	3 59 39.3	11.203
13	11 30 9.11	2.2965	3 48 26.4	11.226
14	11 32 26.86	2.2952	3 37 12.2	11.247
15	11 34 44.54	2.2940	3 25 56.8	11.267
16	11 37 2.14	2.2927	3 14 40.2	11.285
17	11 39 19.67	2.2915	3 3 22.6	11.302
18	11 41 37.12	2.2903	2 52 4.0	11.318
19	11 43 54.50	2.2891	2 40 44.5	11.333
20	11 46 11.81	2.2879	2 29 24.1	11.346
21	11 48 29.05	2.2868	2 18 3.0	11.357
22	11 50 46.23	2.2857	2 6 41.2	11.368
23	11 53 3.34	2.2846	N. 1 55 18.8	11.378

FRIDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 55 20.38	2.2835	N. 1 43 55.8	11.387
1	11 57 37.36	2.2825	1 32 32.4	11.393
2	11 59 54.28	2.2815	1 21 8.6	11.399
3	12 2 11.14	2.2805	1 9 44.5	11.403
4	12 4 27.94	2.2795	0 58 20.2	11.407
5	12 6 44.68	2.2786	0 46 55.7	11.409
6	12 9 1.37	2.2777	0 35 31.1	11.410
7	12 11 18.00	2.2768	0 24 6.5	11.409
8	12 13 34.58	2.2759	0 12 42.0	11.407
9	12 15 51.11	2.2750	N. 0 1 17.7	11.403
10	12 18 7.58	2.2742	S. 0 10 6.4	11.399
11	12 20 24.01	2.2734	0 21 30.2	11.393
12	12 22 40.39	2.2726	0 32 53.6	11.386
13	12 24 56.72	2.2718	0 44 16.5	11.378
14	12 27 13.01	2.2712	0 55 39.0	11.370
15	12 29 29.26	2.2705	1 7 0.9	11.359
16	12 31 45.47	2.2697	1 18 22.1	11.347
17	12 34 1.63	2.2690	1 29 42.5	11.333
18	12 36 17.75	2.2683	1 41 2.1	11.319
19	12 38 33.83	2.2677	1 52 20.8	11.304
20	12 40 49.88	2.2672	2 3 38.6	11.287
21	12 43 5.89	2.2666	2 14 55.3	11.269
22	12 45 21.87	2.2661	2 26 10.9	11.250
23	12 47 37.82	2.2655	2 37 25.3	11.229
24	12 49 53.73	2.2649	S. 2 48 38.4	11.207

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 49 53.73	2.2649	S. 2 48 38.4	11.207
1	12 52 9.61	2.2645	2 59 50.2	11.185
2	12 54 25.47	2.2641	3 11 0.6	11.161
3	12 56 41.30	2.2636	3 22 9.5	11.136
4	12 58 57.10	2.2631	3 33 16.9	11.110
5	13 1 12.87	2.2627	3 44 22.7	11.082
6	13 3 28.62	2.2623	3 55 26.7	11.053
7	13 5 44.35	2.2619	4 6 29.0	11.023
8	13 8 0.05	2.2615	4 17 29.5	10.992
9	13 10 15.73	2.2612	4 28 28.1	10.960
10	13 12 31.39	2.2609	4 39 24.7	10.927
11	13 14 47.04	2.2606	4 50 19.3	10.892
12	13 17 2.67	2.2603	5 1 11.8	10.857
13	13 19 18.28	2.2601	5 12 2.1	10.820
14	13 21 33.88	2.2598	5 22 50.2	10.782
15	13 23 49.46	2.2595	5 33 35.9	10.743
16	13 26 5.02	2.2592	5 44 19.3	10.703
17	13 28 20.57	2.2591	5 55 0.3	10.661
18	13 30 36.11	2.2589	6 5 38.7	10.618
19	13 32 51.64	2.2587	6 16 14.5	10.575
20	13 35 7.16	2.2585	6 26 47.7	10.532
21	13 37 22.66	2.2583	6 37 18.3	10.487
22	13 39 38.15	2.2582	6 47 46.1	10.439
23	13 41 53.64	2.2581	S. 6 58 11.0	10.391

SUNDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 44 9.12	2.2579	S. 7 8 33.0	10.342
1	13 46 24.59	2.2578	7 18 52.1	10.293
2	13 48 40.06	2.2577	7 29 8.2	10.242
3	13 50 55.52	2.2577	7 39 21.2	10.191
4	13 53 10.98	2.2576	7 49 31.1	10.138
5	13 55 26.43	2.2575	7 59 37.8	10.084
6	13 57 41.88	2.2574	8 9 41.2	10.029
7	13 59 57.32	2.2573	8 19 41.3	9.973
8	14 2 12.76	2.2573	8 29 38.0	9.917
9	14 4 28.20	2.2572	8 39 31.4	9.861
10	14 6 43.63	2.2572	8 49 21.3	9.802
11	14 8 59.06	2.2572	8 59 7.6	9.742
12	14 11 14.49	2.2572	9 8 50.3	9.681
13	14 13 29.92	2.2572	9 18 29.3	9.620
14	14 15 45.35	2.2571	9 28 4.7	9.558
15	14 18 0.77	2.2571	9 37 36.3	9.495
16	14 20 16.20	2.2571	9 47 4.1	9.431
17	14 22 31.62	2.2570	9 56 28.0	9.365
18	14 24 47.04	2.2570	10 5 47.9	9.299
19	14 27 2.46	2.2570	10 15 3.9	9.232
20	14 29 17.88	2.2570	10 24 15.8	9.165
21	14 31 33.30	2.2570	10 33 23.7	9.097
22	14 33 48.72	2.2570	10 42 27.5	9.028
23	14 36 4.14	2.2569	10 51 27.1	8.958
24	14 38 19.55	2.2569	S. 11 0 22.4	8.887

MONDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 38 19.55	2.2569	S. 11 0 22.4	8.887
1	14 40 34.97	2.2569	11 9 13.5	8.815
2	14 42 50.38	2.2568	11 18 0.2	8.743
3	14 45 5.79	2.2568	11 26 42.6	8.670
4	14 47 21.20	2.2568	11 35 20.6	8.596
5	14 49 36.61	2.2567	11 43 54.1	8.522
6	14 51 52.01	2.2567	11 52 23.2	8.447
7	14 54 7.41	2.2567	12 0 47.7	8.370
8	14 56 22.81	2.2566	12 9 7.6	8.293
9	14 58 38.20	2.2565	12 17 22.9	8.216
10	15 0 53.59	2.2564	12 25 33.5	8.138
11	15 3 8.97	2.2563	12 33 39.4	8.059
12	15 5 24.35	2.2562	12 41 40.6	7.980
13	15 7 39.72	2.2561	12 49 37.0	7.899
14	15 9 55.08	2.2560	12 57 28.5	7.818
15	15 12 10.44	2.2559	13 5 15.2	7.737
16	15 14 25.79	2.2558	13 12 57.0	7.655
17	15 16 41.13	2.2556	13 20 33.8	7.573
18	15 18 56.46	2.2554	13 28 5.7	7.490
19	15 21 11.78	2.2553	13 35 32.6	7.406
20	15 23 27.09	2.2551	13 42 54.4	7.321
21	15 25 42.39	2.2548	13 50 11.1	7.236
22	15 27 57.67	2.2546	13 57 22.7	7.151
23	15 30 12.94	2.2544	S. 14 4 29.2	7.066

TUESDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 32 28.20	2.2542	S. 14 11 30.6	6.980
1	15 34 43.44	2.2539	14 18 26.8	6.892
2	15 36 58.66	2.2536	14 25 17.7	6.804
3	15 39 13.87	2.2533	14 32 3.3	6.716
4	15 41 29.06	2.2529	14 38 43.6	6.627
5	15 43 44.22	2.2525	14 45 18.6	6.539
6	15 45 59.36	2.2522	14 51 48.3	6.450
7	15 48 14.48	2.2518	14 58 12.6	6.360
8	15 50 29.58	2.2515	15 4 31.5	6.270
9	15 52 44.66	2.2511	15 10 45.0	6.179
10	15 54 59.71	2.2506	15 16 53.0	6.088
11	15 57 14.73	2.2501	15 22 55.6	5.997
12	15 59 29.72	2.2496	15 28 52.7	5.906
13	16 1 44.68	2.2491	15 34 44.3	5.814
14	16 3 59.61	2.2486	15 40 30.3	5.721
15	16 6 14.51	2.2481	15 46 10.8	5.628
16	16 8 29.38	2.2475	15 51 45.7	5.535
17	16 10 44.21	2.2468	15 57 15.0	5.442
18	16 12 59.00	2.2462	16 2 38.8	5.349
19	16 15 13.75	2.2456	16 7 56.9	5.255
20	16 17 28.47	2.2450	16 13 9.4	5.161
21	16 19 43.15	2.2443	16 18 16.2	5.066
22	16 21 57.78	2.2435	16 23 17.3	4.971
23	16 24 12.37	2.2427	16 28 12.7	4.877
24	16 26 26.91	2.2419	S. 16 33 2.5	4,782

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 26 26.91	2.2419	S. 16 33 2.5	4.782
1	16 28 41.40	2.2412	16 37 46.6	4.687
2	16 30 55.85	2.2404	16 42 24.9	4.591
3	16 33 10.25	2.2396	16 46 57.5	4.495
4	16 35 24.60	2.2387	16 51 24.3	4.399
5	16 37 38.89	2.2377	16 55 45.4	4.303
6	16 39 53.13	2.2368	17 0 0.7	4.207
7	16 42 7.31	2.2358	17 4 10.2	4.111
8	16 44 21.43	2.2349	17 8 14.0	4.015
9	16 46 35.50	2.2340	17 12 12.0	3.918
10	16 48 49.51	2.2329	17 16 4.2	3.822
11	16 51 3.45	2.2318	17 19 50.6	3.724
12	16 53 17.32	2.2307	17 23 31.1	3.627
13	16 55 31.13	2.2296	17 27 5.8	3.531
14	16 57 44.87	2.2284	17 30 34.8	3.434
15	16 59 58.54	2.2272	17 33 57.9	3.337
16	17 2 12.14	2.2261	17 37 15.2	3.240
17	17 4 25.67	2.2249	17 40 26.7	3.143
18	17 6 39.12	2.2236	17 43 32.4	3.046
19	17 8 52.50	2.2223	17 46 32.3	2.949
20	17 11 5.80	2.2210	17 49 26.3	2.852
21	17 13 19.02	2.2197	17 52 14.5	2.755
22	17 15 32.16	2.2183	17 54 56.9	2.658
23	17 17 45.22	2.2169	S. 17 57 33.5	2.561

THURSDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 19 58.19	2.2155	S. 18 0 4.2	2.464
1	17 22 11.08	2.2141	18 2 29.1	2.367
2	17 24 23.88	2.2126	18 4 48.2	2.270
3	17 26 36.59	2.2111	18 7 1.5	2.173
4	17 28 49.21	2.2096	18 9 9.0	2.077
5	17 31 1.74	2.2080	18 11 10.7	1.980
6	17 33 14.17	2.2064	18 13 6.6	1.883
7	17 35 26.51	2.2048	18 14 56.7	1.787
8	17 37 38.75	2.2032	18 16 41.0	1.691
9	17 39 50.89	2.2016	18 18 19.6	1.595
10	17 42 2.94	2.1999	18 19 52.4	1.499
11	17 44 14.88	2.1982	18 21 19.5	1.403
12	17 46 26.72	2.1965	18 22 40.8	1.307
13	17 48 38.46	2.1947	18 23 56.4	1.212
14	17 50 50.09	2.1929	18 25 6.2	1.116
15	17 53 1.61	2.1912	18 26 10.3	1.021
16	17 55 13.03	2.1893	18 27 8.7	0.926
17	17 57 24.33	2.1874	18 28 1.4	0.831
18	17 59 35.52	2.1856	18 28 48.4	0.737
19	18 1 46.60	2.1837	18 29 29.8	0.642
20	18 3 57.56	2.1817	18 30 5.5	0.547
21	18 6 8.41	2.1798	18 30 35.5	0.453
22	18 8 19.14	2.1778	18 30 59.9	0.360
23	18 10 29.75	2.1759	18 31 18.7	0.267
24	18 12 40.25	2.1739	S. 18 31 31.9	0.173

FRIDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 12 40.25	2.1739	S. 18 31 31.9	0.173
1	18 14 50.62	2.1718	18 31 39.5	− 0.080
2	18 17 0.87	2.1698	18 31 41.5	+ 0.012
3	18 19 11.00	2.1678	18 31 38.0	0.105
4	18 21 21.01	2.1657	18 31 28.9	0.197
5	18 23 30.89	2.1636	18 31 14.3	0.289
6	18 25 40.64	2.1614	18 30 54.2	0.381
7	18 27 50.26	2.1593	18 30 28.6	0.472
8	18 29 59.76	2.1572	18 29 57.5	0.564
9	18 32 9.13	2.1551	18 29 20.9	0.655
10	18 34 18.37	2.1529	18 28 38.9	0.745
11	18 36 27.48	2.1507	18 27 51.5	0.835
12	18 38 36.45	2.1484	18 26 58.7	0.925
13	18 40 45.29	2.1462	18 26 0.5	1.015
14	18 42 54.00	2.1440	18 24 56.9	1.104
15	18 45 2.57	2.1417	18 23 48.0	1.192
16	18 47 11.00	2.1394	18 22 33.8	1.281
17	18 49 19.30	2.1371	18 21 14.3	1.370
18	18 51 27.46	2.1348	18 19 49.4	1.458
19	18 53 35.48	2.1325	18 18 19.3	1.545
20	18 55 43.36	2.1302	18 16 44.0	1.632
21	18 57 51.11	2.1280	18 15 3.4	1.720
22	18 59 58.72	2.1257	18 13 17.6	1.807
23	19 2 6.19	2.1233	S. 18 11 26.6	1.893

SATURDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 4 13.51	2.1209	S. 18 9 30.5	1.978
1	19 6 20.69	2.1185	18 7 29.3	2.063
2	19 8 27.73	2.1162	18 5 23.0	2.148
3	19 10 34.63	2.1138	18 3 11.5	2.233
4	19 12 41.38	2.1113	18 0 55.0	2.318
5	19 14 47.99	2.1090	17 58 33.4	2.402
6	19 16 54.46	2.1066	17 56 6.8	2.485
7	19 19 0.78	2.1042	17 53 35.2	2.568
8	19 21 6.96	2.1017	17 50 58.6	2.651
9	19 23 12.99	2.0993	17 48 17.1	2.733
10	19 25 18.88	2.0969	17 45 30.6	2.815
11	19 27 24.62	2.0945	17 42 39.3	2.896
12	19 29 30.22	2.0921	17 39 43.1	2.977
13	19 31 35.67	2.0897	17 36 42.0	3.058
14	19 33 40.98	2.0872	17 33 36.1	3.138
15	19 35 46.14	2.0848	17 30 25.4	3.218
16	19 37 51.16	2.0824	17 27 9.9	3.297
17	19 39 56.03	2.0799	17 23 49.7	3.377
18	19 42 0.75	2.0775	17 20 24.7	3.456
19	19 44 5.33	2.0752	17 16 55.0	3.534
20	19 46 9.77	2.0728	17 13 20.6	3.612
21	19 48 14.06	2.0703	17 9 41.6	3.689
22	19 50 18.20	2.0679	17 5 57.9	3.766
23	19 52 22.20	2.0655	17 2 9.6	3.842
24	19 54 26.06	2.0631	S. 16 58 16.8	3.918

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 25.					TUESDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 54 26.06	2.0631	S. 16 58 16.8	3.918	0	21 30 55.31	1.9641	S. 12 30 53.1	7.050
1	19 56 29.77	2.0607	16 54 19.4	3.994	1	21 32 53.11	1.9626	12 23 48.5	7.104
2	19 58 33.34	2.0583	16 50 17.5	4.070	2	21 34 50.82	1.9611	12 16 40.6	7.158
3	20 0 36.77	2.0559	16 46 11.0	4.145	3	21 36 48.44	1.9597	12 9 29.5	7.211
4	20 2 40.05	2.0535	16 42 0.1	4.219	4	21 38 45.98	1.9582	12 2 15.2	7.264
5	20 4 43.19	2.0512	16 37 44.8	4.293	5	21 40 43.43	1.9567	11 54 57.8	7.317
6	20 6 46.19	2.0488	16 33 25.0	4.367	6	21 42 40.79	1.9553	11 47 37.2	7.368
7	20 8 49.05	2.0465	16 29 0.8	4.440	7	21 44 38.07	1.9540	11 40 13.6	7.419
8	20 10 51.77	2.0442	16 24 32.2	4.512	8	21 46 35.27	1.9527	11 32 46.9	7.471
9	20 12 54.35	2.0418	16 19 59.3	4.584	9	21 48 32.39	1.9514	11 25 17.1	7.522
10	20 14 56.79	2.0395	16 15 22.1	4.656	10	21 50 29.44	1.9502	11 17 44.3	7.571
11	20 16 59.09	2.0372	16 10 40.6	4.727	11	21 52 26.41	1.9489	11 10 8.6	7.620
12	20 19 1.25	2.0349	16 5 54.8	4.798	12	21 54 23.31	1.9477	11 2 29.9	7.670
13	20 21 3.27	2.0326	16 1 4.8	4.868	13	21 56 20.14	1.9466	10 54 48.2	7.718
14	20 23 5.16	2.0303	15 56 10.6	4.938	14	21 58 16.90	1.9454	10 47 3.7	7.766
15	20 25 6.91	2.0281	15 51 12.2	5.008	15	22 0 13.59	1.9443	10 39 16.3	7.813
16	20 27 8.53	2.0258	15 46 9.6	5.077	16	22 2 10.22	1.9433	10 31 26.1	7.861
17	20 29 10.01	2.0236	15 41 2.9	5.146	17	22 4 6.79	1.9422	10 23 33.0	7.908
18	20 31 11.36	2.0214	15 35 52.1	5.214	18	22 6 3.29	1.9412	10 15 37.1	7.954
19	20 33 12.58	2.0192	15 30 37.2	5.282	19	22 7 59.74	1.9403	10 7 38.5	8.000
20	20 35 13.67	2.0170	15 25 18.3	5.349	20	22 9 56.13	1.9393	9 59 37.1	8.046
21	20 37 14.62	2.0148	15 19 55.3	5.416	21	22 11 52.46	1.9384	9 51 33.0	8.090
22	20 39 15.44	2.0127	15 14 28.4	5.482	22	22 13 48.74	1.9376	9 43 26.3	8.134
23	20 41 16.14	2.0106	S. 15 8 57.5	5.548	23	22 15 44.97	1.9367	S. 9 35 16.9	8.178
	MONDAY 26.					WEDNESDAY 28.			
0	20 43 16.71	2.0084	S. 15 3 22.6	5.614	0	22 17 41.15	1.9359	S. 9 27 4.9	8.221
1	20 45 17.15	2.0063	14 57 43.8	5.679	1	22 19 37.28	1.9352	9 18 50.3	8.264
2	20 47 17.47	2.0042	14 52 1.1	5.743	2	22 21 33.37	1.9345	9 10 33.2	8.307
3	20 49 17.66	2.0022	14 46 14.6	5.808	3	22 23 29.42	1.9338	9 2 13.5	8.349
4	20 51 17.73	2.0002	14 40 24.2	5.871	4	22 25 25.43	1.9332	8 53 51.3	8.391
5	20 53 17.68	1.9982	14 34 30.0	5.934	5	22 27 21.40	1.9326	8 45 26.6	8.432
6	20 55 17.51	1.9962	14 28 32.1	5.997	6	22 29 17.34	1.9321	8 36 59.5	8.472
7	20 57 17.22	1.9942	14 22 30.4	6.059	7	22 31 13.25	1.9315	8 28 30.0	8.512
8	20 59 16.81	1.9922	14 16 25.0	6.122	8	22 33 9.12	1.9309	8 19 58.1	8.552
9	21 1 16.28	1.9902	14 10 15.8	6.183	9	22 35 4.96	1.9305	8 11 23.8	8.591
10	21 3 15.64	1.9883	14 4 3.0	6.244	10	22 37 0.78	1.9301	8 2 47.2	8.629
11	21 5 14.88	1.9864	13 57 46.5	6.305	11	22 38 56.57	1.9297	7 54 8.3	8.667
12	21 7 14.01	1.9846	13 51 26.4	6.365	12	22 40 52.34	1.9293	7 45 27.2	8.704
13	21 9 13.03	1.9827	13 45 2.7	6.424	13	22 42 48.09	1.9291	7 36 43.8	8.741
14	21 11 11.94	1.9809	13 38 35.5	6.483	14	22 44 43.83	1.9288	7 27 58.2	8.777
15	21 13 10.74	1.9791	13 32 4.7	6.542	15	22 46 39.55	1.9285	7 19 10.5	8.813
16	21 15 9.43	1.9773	13 25 30.4	6.600	16	22 48 35.25	1.9283	7 10 20.6	8.849
17	21 17 8.02	1.9756	13 18 52.7	6.657	17	22 50 30.95	1.9282	7 1 28.6	8.885
18	21 19 6.50	1.9738	13 12 11.5	6.715	18	22 52 26.64	1.9281	6 52 34.4	8.920
19	21 21 4.88	1.9722	13 5 26.9	6.772	19	22 54 22.32	1.9280	6 43 38.2	8.954
20	21 23 3.16	1.9705	12 58 38.9	6.829	20	22 56 18.00	1.9280	6 34 40.0	8.987
21	21 25 1.34	1.9689	12 51 47.4	6.886	21	22 58 13.68	1.9280	6 25 39.8	9.020
22	21 26 59.43	1.9673	12 44 52.6	6.941	22	23 0 9.36	1.9280	6 16 37.6	9.052
23	21 28 57.42	1.9657	12 37 54.5	6.996	23	23 2 5.04	1.9281	6 7 33.5	9.084
24	21 30 55.31	1.9641	S. 12 30 53.1	7.050	24	23 4 0.73	1.9282	S. 5 58 27.5	9.116

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 4 0.73	1.9282	S. 5 58 27.5	9.116
1	23 5 56.43	1.9284	5 49 19.6	9.147
2	23 7 52.14	1.9286	5 40 9.9	9.177
3	23 9 47.86	1.9288	5 30 58.4	9.207
4	23 11 43.60	1.9292	5 21 45.1	9.237
5	23 13 39.36	1.9295	5 12 30.0	9.266
6	23 15 35.14	1.9298	5 3 13.2	9.294
7	23 17 30.94	1.9302	4 53 54.8	9.321
8	23 19 26.77	1.9307	4 44 34.7	9.348
9	23 21 22.63	1.9312	4 35 13.0	9.375
10	23 23 18.52	1.9317	4 25 49.7	9.401
11	23 25 14.44	1.9322	4 16 24.9	9.426
12	23 27 10.39	1.9328	4 6 58.6	9.451
13	23 29 6.38	1.9336	3 57 30.8	9.475
14	23 31 2.42	1.9343	3 48 1.6	9.499
15	23 32 58.50	1.9351	3 38 30.9	9.522
16	23 34 54.63	1.9358	3 28 58.9	9.545
17	23 36 50.80	1.9366	3 19 25.5	9.567
18	23 38 47.02	1.9375	3 9 50.8	9.588
19	23 40 43.30	1.9384	3 0 14.9	9.609
20	23 42 39.63	1.9393	2 50 37.7	9.630
21	23 44 36.02	1.9403	2 40 59.3	9.649
22	23 46 32.47	1.9413	2 31 19.8	9.668
23	23 48 28.98	1.9424	S. 2 21 39.1	9.687

FRIDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 50 25.56	1.9436	S. 2 11 57.3	9.705
1	23 52 22.21	1.9447	2 2 14.5	9.722
2	23 54 18.93	1.9459	1 52 30.7	9.738
3	23 56 15.72	1.9471	1 42 45.9	9.755
4	23 58 12.58	1.9484	1 33 0.1	9.771
5	0 0 9.53	1.9498	1 23 13.4	9.785
6	0 2 6.56	1.9512	1 13 25.9	9.799
7	0 4 3.67	1.9526	1 3 37.5	9.812
8	0 6 0.87	1.9541	0 53 48.4	9.825
9	0 7 58.16	1.9556	0 43 58.5	9.837
10	0 9 55.54	1.9571	0 34 7.9	9.849
11	0 11 53.01	1.9587	0 24 16.6	9.860
12	0 13 50.58	1.9603	0 14 24.7	9.870
13	0 15 48.25	1.9620	S. 0 4 32.2	9.880
14	0 17 46.02	1.9637	N. 0 5 20.9	9.889
15	0 19 43.89	1.9654	0 15 14.5	9.897
16	0 21 41.87	1.9672	0 25 8.5	9.904
17	0 23 39.96	1.9691	0 35 3.0	9.911
18	0 25 38.16	1.9710	0 44 57.9	9.918
19	0 27 36.48	1.9729	0 54 53.2	9.923
20	0 29 34.91	1.9748	1 4 48.7	9.928
21	0 31 33.46	1.9768	1 14 44.5	9.932
22	0 33 32.13	1.9789	1 24 40.5	9.935
23	0 35 30.93	1.9810	1 34 36.7	9.937
24	0 37 29.85	1.9831	N. 1 44 33.0	9.939

SATURDAY, MAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 37 29.85	1.9831	N. 1 44 33.0	9.939

PHASES OF THE MOON.

		d	h	m
● New Moon	April	4	2	30.6
☽ First Quarter		11	8	44.0
○ Full Moon		18	2	59.1
☾ Last Quarter		25	17	15.4

		d	h
☾ Perigee	April	14	17.5
☾ Apogee		26	16.1

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Antares	W.	88° 38′ 15″	3068	90° 7′ 4″	3061	91° 36′ 1″	3054	93° 5′ 7″	3047
	α Aquilæ	W.	44 57 32	3983	46 9 28	3927	47 22 20	3877	48 36 3	3829
	Sun	E.	34 57 10	3388	33 34 40	3382	32 12 3	3375	30 49 18	3368
2	Antares	W.	100 32 50	3010	102 2 50	3002	103 33 0	2995	105 3 19	2987
	α Aquilæ	W.	54 55 58	3633	56 13 57	3601	57 32 30	3570	58 51 37	3542
	Sun	E.	23 53 39	3336	22 30 9	3331	21 6 33	3326	19 42 51	3321
6	Sun	W.	22 45 24	3022	24 15 9	3010	25 45 9	2999	27 15 23	2988
	Saturn	E.	53 34 26	2696	51 57 41	2689	50 20 46	2681	48 43 41	2674
	Pollux	E.	73 19 14	2744	71 43 32	2736	70 7 40	2729	68 31 38	2722
7	Sun	W.	34 50 0	2935	36 21 34	2925	37 53 21	2916	39 25 20	2906
	Saturn	E.	40 35 51	2640	38 57 50	2634	37 19 41	2628	35 41 24	2623
	Pollux	E.	60 29 27	2695	58 52 40	2689	57 15 46	2686	55 38 47	2682
	Regulus	E.	96 7 53	2590	94 26 45	2582	92 49 25	2574	91 9 54	2566
8	Sun	W.	47 8 15	2860	48 41 25	2851	50 14 47	2842	51 48 20	2834
	Pollux	E.	47 32 54	2674	45 55 39	2675	44 18 25	2676	42 41 13	2679
	Regulus	E.	82 49 31	2525	81 8 52	2517	79 28 3	2509	77 47 2	2502
	Mars	E.	91 5 33	2497	89 24 15	2489	87 42 46	2482	86 1 7	2475
	Jupiter	E.	113 25 33	2485	111 43 59	2477	110 2 14	2470	108 20 19	2462
9	Sun	W.	59 38 54	2790	61 13 35	2782	62 48 27	2774	64 23 29	2766
	Pollux	E.	34 37 7	2725	33 1 1	2743	31 25 18	2765	29 50 4	2792
	Regulus	E.	69 19 19	2463	67 37 14	2455	65 54 57	2447	64 12 29	2440
	Mars	E.	77 30 21	2439	75 47 42	2431	74 4 52	2424	72 21 52	2417
	Jupiter	E.	99 47 57	2424	98 4 56	2417	96 21 45	2409	94 38 23	2401
10	Sun	W.	72 21 27	2724	73 57 35	2716	75 33 54	2707	77 10 24	2700
	Aldebaran	W.	24 31 47	2398	26 15 24	2391	27 59 11	2384	29 43 9	2376
	Regulus	E.	55 37 32	2403	53 54 1	2395	52 10 19	2388	50 26 27	2381
	Mars	E.	63 44 25	2384	62 0 27	2377	60 16 19	2371	58 32 2	2364
	Jupiter	E.	85 58 47	2364	84 14 20	2356	82 29 42	2349	80 44 54	2342
	Spica	E.	109 9 32	2418	107 26 23	2410	105 43 3	2403	103 59 32	2394
11	Sun	W.	85 15 33	2660	86 53 6	2652	88 30 50	2645	90 8 44	2638
	Aldebaran	W.	38 25 39	2339	40 10 41	2333	41 55 53	2326	43 41 15	2319
	Regulus	E.	41 44 34	2346	39 59 41	2339	38 14 39	2333	36 29 27	2326
	Mars	E.	49 48 17	2333	48 3 6	2327	46 17 46	2322	44 32 18	2317
	Jupiter	E.	71 58 14	2306	70 12 23	2299	68 26 22	2291	66 40 10	2285
	Spica	E.	95 19 10	2357	93 34 34	2350	91 49 47	2343	90 4 50	2336
12	Sun	W.	98 20 39	2602	99 59 31	2596	101 38 32	2589	103 17 42	2583
	Aldebaran	W.	52 30 35	2285	54 16 56	2279	56 3 27	2272	57 50 7	2267
	Saturn	W.	28 6 4	2362	29 50 34	2350	31 35 21	2339	33 20 24	2329
	Mars	E.	35 43 9	2294	33 57 0	2290	32 10 46	2288	30 24 29	2286
	Jupiter	E.	57 46 43	2252	55 59 33	2246	54 12 14	2240	52 24 46	2234
	Spica	E.	81 17 37	2303	79 31 42	2297	77 45 38	2291	75 59 26	2285
13	Sun	W.	111 35 36	2554	113 15 34	2549	114 55 39	2545	116 35 50	2540
	Aldebaran	W.	66 45 34	2239	68 33 4	2234	70 20 41	2230	72 8 24	2226

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Antares	W.	94° 34′ 22″	3039	96° 3′ 46″	3033	97° 33′ 18″	3026	99° 2′ 59″	3018
	α Aquilæ	W.	49 50 35	3785	51 5 53	3744	52 21 54	3705	53 38 36	3667
	Sun	E.	29 26 25	3362	28 3 25	3355	26 40 17	3349	25 17 2	3342
2	Antares	W.	106 33 48	2980	108 4 26	2973	109 35 13	2965	111 6 10	2957
	α Aquilæ	W.	60 11 15	3515	61 31 23	3488	62 52 1	3463	64 13 7	3439
	Sun	E.	18 19 4	3318	16 55 13	3316	15 31 21	3317	14 7 30	3322
6	Sun	W.	28 45 51	2977	30 16 33	2965	31 47 29	2955	33 18 38	2945
	Saturn	E.	47 6 26	2667	45 29 2	2660	43 51 28	2652	42 13 44	2646
	Pollux	E.	66 55 27	2716	65 19 8	2710	63 42 42	2704	62 6 8	2699
7	Sun	W.	40 57 31	2897	42 29 54	2887	44 2 29	2878	45 35 16	2869
	Saturn	E.	34 3 0	2618	32 24 30	2614	30 45 54	2611	29 7 14	2609
	Pollux	E.	54 1 43	2679	52 24 35	2676	50 47 23	2675	49 10 9	2674
	Regulus	E.	89 30 12	2558	87 50 19	2549	86 10 14	2541	84 29 58	2533
8	Sun	W.	53 22 4	2825	54 56 0	2816	56 30 7	2808	58 4 25	2799
	Pollux	E.	41 4 5	2684	39 27 4	2691	37 50 12	2700	36 13 32	2711
	Regulus	E.	76 5 52	2494	74 24 30	2486	72 42 57	2478	71 1 13	2471
	Mars	E.	84 19 18	2467	82 37 19	2460	80 55 10	2453	79 12 51	2446
	Jupiter	E.	106 38 13	2455	104 55 56	2446	103 13 27	2438	101 30 47	2431
9	Sun	W.	65 58 42	2756	67 34 7	2748	69 9 43	2740	70 45 30	2732
	Pollux	E.	28 15 26	2827	26 41 33	2869	25 8 35	2924	23 36 46	2991
	Regulus	E.	62 29 51	2432	60 47 2	2425	59 4 3	2417	57 20 53	2410
	Mars	E.	70 38 42	2410	68 55 22	2404	67 11 53	2397	65 28 14	2390
	Jupiter	E.	92 54 49	2394	91 11 5	2386	89 27 10	2378	87 43 4	2371
10	Sun	W.	78 47 4	2692	80 23 55	2684	82 0 57	2675	83 38 10	2668
	Aldebaran	W.	31 27 18	2369	33 11 37	2362	34 56 7	2354	36 40 48	2347
	Regulus	E.	48 42 25	2374	46 58 13	2366	45 13 50	2359	43 29 17	2353
	Mars	E.	56 47 35	2357	55 2 59	2351	53 18 14	2345	51 33 20	2339
	Jupiter	E.	78 59 55	2334	77 14 45	2327	75 29 25	2320	73 43 55	2313
	Spica	E.	102 15 49	2387	100 31 55	2380	98 47 51	2372	97 3 36	2364
11	Sun	W.	91 46 47	2631	93 25 0	2624	95 3 23	2616	96 41 56	2609
	Aldebaran	W.	45 26 47	2312	47 12 29	2305	48 58 21	2298	50 44 23	2291
	Regulus	E.	34 44 6	2320	32 58 36	2314	31 12 57	2309	29 27 10	2304
	Mars	E.	42 46 43	2311	41 1 0	2306	39 15 9	2302	37 29 12	2298
	Jupiter	E.	64 53 48	2278	63 7 16	2272	61 20 35	2265	59 33 44	2258
	Spica	E.	88 19 43	2329	86 34 26	2322	84 48 59	2316	83 3 23	2309
12	Sun	W.	104 57 0	2577	106 36 27	2571	108 16 2	2565	109 55 45	2559
	Aldebaran	W.	59 36 55	2261	61 23 52	2255	63 10 58	2249	64 58 12	2244
	Saturn	W.	35 5 41	2320	36 51 12	2311	38 36 55	2303	40 22 50	2295
	Mars	E.	28 38 9	2285	26 51 48	2285	25 5 26	2285	23 19 5	2286
	Jupiter	E.	50 37 9	2229	49 49 24	2223	47 1 30	2217	45 13 28	2212
	Spica	E.	74 13 5	2280	72 26 36	2274	70 39 59	2269	68 53 14	2264
13	Sun	W.	118 16 7	2536	119 56 30	2533	121 36 58	2530	123 17 30	2526
	Aldebaran	W.	73 56 13	2221	75 44 9	2217	77 32 11	2214	79 20 18	2210

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III$^{\text{h}}$.	P. L. of Diff.	VI$^{\text{h}}$.	P. L. of Diff.	IX$^{\text{h}}$.	P. L. of Diff.
13	SATURN	W.	42° 8′ 57″	2288	43° 55′ 14″	2282	45° 41′ 40″	2276	47° 28′ 15″	2270
	Pollux	W.	25 11 48	2684	26 48 49	2627	28 27 7	2580	30 6 30	2540
	JUPITER	E.	43 25 19	2207	41 37 2	2202	39 48 38	2198	38 0 7	2194
	Spica	E.	67 6 22	2260	65 19 24	2256	63 32 19	2251	61 45 8	2248
14	SUN	W.	124 58 7	2523	126 38 48	2521	128 19 32	2519	130 0 19	2518
	Aldebaran	W.	81 8 30	2208	82 56 46	2205	84 45 6	2202	86 33 30	2200
	SATURN	W.	56 23 7	2247	58 10 24	2244	59 57 46	2241	61 45 12	2239
	Pollux	W.	38 35 3	2408	40 18 27	2391	42 2 15	2375	43 46 25	2363
	Spica	E.	52 48 5	2236	51 0 31	2235	49 12 55	2234	47 25 18	2233
	Antares	E.	98 35 44	2271	96 49 2	2268	95 2 15	2266	93 15 25	2263
15	Aldebaran	W.	95 36 5	2196	97 24 39	2196	99 13 12	2197	101 1 44	2198
	SATURN	W.	70 43 7	2233	72 30 46	2233	74 18 25	2233	76 6 3	2234
	Pollux	W.	52 31 11	2319	54 16 43	2314	56 2 22	2310	57 48 7	2307
	Spica	E.	38 27 27	2243	36 40 3	2247	34 52 46	2253	33 5 38	2260
	Antares	E.	84 20 37	2259	82 33 37	2260	80 46 39	2262	78 59 43	2264
16	SATURN	W.	85 3 39	2246	86 50 58	2250	88 38 11	2254	90 25 18	2259
	Pollux	W.	66 37 40	2302	68 23 36	2304	70 9 29	2307	71 55 19	2309
	Regulus	W.	29 59 46	2220	31 47 43	2223	33 35 36	2227	35 23 23	2231
	MARS	W.	22 23 44	2262	24 10 39	2260	25 57 38	2259	27 44 38	2260
	Antares	E.	70 6 3	2282	68 19 37	2287	66 33 19	2294	64 47 11	2301
17	SATURN	W.	99 18 52	2290	101 5 6	2298	102 51 8	2307	104 36 58	2315
	Pollux	W.	80 43 6	2334	82 28 16	2341	84 13 16	2348	85 58 5	2356
	Regulus	W.	44 20 33	2260	46 7 32	2266	47 54 21	2274	49 40 59	2282
	MARS	W.	36 38 53	2278	38 25 25	2284	40 11 48	2291	41 58 1	2299
	Antares	E.	55 59 24	2347	54 14 33	2359	52 29 59	2371	50 45 43	2385
18	Regulus	W.	58 30 55	2330	60 16 11	2340	62 1 12	2351	63 45 57	2363
	MARS	W.	50 46 2	2344	52 30 57	2355	54 15 36	2366	55 59 59	2378
	JUPITER	W.	28 57 20	2297	30 43 24	2308	32 29 12	2319	34 14 44	2331
	Antares	E.	42 9 51	2472	40 27 58	2493	38 46 35	2517	37 5 45	2543
19	Regulus	W.	72 25 22	2426	74 8 20	2439	75 50 59	2453	77 33 19	2467
	MARS	W.	64 37 36	2441	66 20 12	2455	68 2 28	2469	69 44 25	2483
	JUPITER	W.	42 58 2	2393	44 41 46	2407	46 25 11	2420	48 8 17	2434
	Spica	W.	19 25 42	2572	21 5 15	2564	22 44 59	2561	24 24 48	2561
	α Aquilæ	E.	78 47 22	2894	77 14 55	2913	75 42 53	2935	74 11 18	2957
20	Regulus	W.	85 59 59	2539	87 40 18	2554	89 20 16	2569	90 59 53	2585
	MARS	W.	78 9 5	2558	79 48 58	2573	81 28 30	2588	83 7 41	2604
	JUPITER	W.	56 38 43	2507	58 19 46	2522	60 0 29	2537	61 40 51	2553
	Spica	W.	32 42 40	2594	34 21 43	2604	36 0 32	2615	37 39 6	2627
	α Aquilæ	E.	66 40 52	3087	65 12 27	3117	63 44 38	3148	62 17 27	3182
	Fomalhaut	E.	99 9 39	2879	97 36 53	2891	96 4 23	2905	94 32 10	2918
21	Regulus	W.	99 12 46	2661	100 50 18	2676	102 27 30	2692	104 4 21	2707
	JUPITER	W.	69 57 24	2629	71 35 40	2614	73 13 35	2659	74 51 10	2675
	Spica	W.	45 47 46	2692	47 24 37	2705	49 1 10	2719	50 37 25	2733
	α Aquilæ	E.	55 12 8	3377	53 49 25	3423	52 27 35	3471	51 6 39	3594

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Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV$^{\text{h}}$.	P. L. of Diff.	XVIII$^{\text{h}}$.	P. L. of Diff.	XXI$^{\text{h}}$.	P. L. of Diff.
13	Saturn	W.	49° 14′ 59″	2264	51° 1′ 51″	2260	52° 48′ 50″	2255	54° 35′ 56″	2251
	Pollux	W.	31 46 48	2504	33 27 55	2475	35 9 43	2450	36 52 7	2427
	Jupiter	E.	36 11 30	2190	34 22 47	2186	32 33 58	2182	30 45 4	2179
	Spica	E.	59 57 52	2245	58 10 31	2242	56 23 6	2239	54 35 37	2237
14	Sun	W.	131 41 7	2517	133 21 56	2516	135 2 47	2516	136 43 38	2517
	Aldebaran	W.	88 21 58	2198	90 10 28	2198	91 58 59	2196	93 47 32	2196
	Saturn	W.	63 32 42	2236	65 20 16	2235	67 7 52	2234	68 55 29	2233
	Pollux	W.	45 30 53	2352	47 15 37	2342	49 0 36	2333	50 45 48	2325
	Spica	E.	45 37 40	2234	43 50 3	2235	42 2 28	2237	40 14 56	2239
	Antares	E.	91 28 31	2261	89 41 34	2260	87 54 36	2260	86 7 37	2259
15	Aldebaran	W.	102 50 15	2200	104 38 43	2202	106 27 8	2204	108 15 29	2207
	Saturn	W.	77 53 40	2235	79 41 15	2237	81 28 47	2240	83 16 15	2243
	Pollux	W.	59 33 57	2304	61 19 50	2302	63 5 46	2302	64 51 43	2302
	Spica	E.	31 18 40	2268	29 31 54	2279	27 45 23	2291	25 59 10	2305
	Antares	E.	77 12 50	2266	75 26 1	2269	73 39 16	2272	71 52 36	2277
16	Saturn	W.	92 12 18	2264	93 59 10	2270	95 45 54	2277	97 32 28	2283
	Pollux	W.	73 41 5	2313	75 26 46	2317	77 12 20	2322	78 57 47	2328
	Regulus	W.	37 11 4	2235	38 58 39	2241	40 46 6	2247	42 33 24	2253
	Mars	W.	29 31 37	2261	31 18 34	2264	33 5 26	2268	34 52 13	2272
	Antares	E.	63 1 13	2309	61 15 26	2317	59 29 52	2326	57 44 31	2336
17	Saturn	W.	106 22 35	2324	108 7 59	2334	109 53 9	2344	111 38 5	2355
	Pollux	W.	87 42 43	2365	89 27 8	2374	91 11 20	2384	92 55 18	2394
	Regulus	W.	51 27 25	2291	53 13 38	2300	54 59 38	2309	56 45 24	2320
	Mars	W.	43 44 2	2307	45 29 51	2315	47 15 28	2324	49 0 52	2334
	Antares	E.	49 1 47	2400	47 18 12	2416	45 35 0	2433	43 52 12	2452
18	Regulus	W.	65 30 25	2375	67 14 36	2387	68 58 30	2400	70 42 5	2412
	Mars	W.	57 44 6	2390	59 27 55	2402	61 11 27	2415	62 54 41	2428
	Jupiter	W.	35 59 59	2342	37 44 57	2355	39 29 37	2367	41 13 59	2380
	Antares	E.	35 25 31	2571	33 45 56	2601	32 7 3	2636	30 28 57	2675
19	Regulus	W.	79 15 19	2481	80 56 59	2495	82 38 19	2510	84 19 19	2524
	Mars	W.	71 26 2	2497	73 7 19	2512	74 48 15	2527	76 28 50	2542
	Jupiter	W.	49 51 3	2448	51 33 29	2463	53 15 34	2477	54 57 19	2492
	Spica	W.	26 4 36	2564	27 44 20	2569	29 23 57	2577	31 3 24	2585
	α Aquilæ	E.	72 40 11	2980	71 9 33	3005	69 39 26	3031	68 9 52	3059
20	Regulus	W.	92 39 9	2600	94 18 4	2615	95 56 39	2630	97 34 53	2646
	Mars	W.	84 46 30	2620	86 24 58	2635	88 3 5	2651	89 40 51	2667
	Jupiter	W.	63 20 51	2568	65 0 30	2583	66 39 49	2598	68 18 47	2613
	Spica	W.	39 17 24	2639	40 55 26	2652	42 33 10	2665	44 10 37	2678
	α Aquilæ	E.	60 50 56	3217	59 25 7	3253	58 0 1	3293	56 35 41	3333
	Fomalhaut	E.	93 0 14	2932	91 28 36	2947	89 57 17	2962	88 26 17	2977
21	Regulus	W.	105 40 52	2722	107 17 3	2737	108 52 54	2751	110 28 26	2766
	Jupiter	W.	76 28 24	2689	78 5 18	2704	79 41 53	2719	81 18 8	2734
	Spica	W.	52 13 21	2747	53 48 59	2760	55 24 19	2774	56 59 21	2783
	α Aquilæ	E.	49 46 41	3579	48 27 44	3637	47 9 50	3700	45 53 3	3763

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LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
21	Fomalhaut	E.	86° 55′ 36″	2993	85° 25′ 15″	3011	83° 55′ 16″	3028	82° 25′ 38″	3046
	Venus	E.	97 48 19	2974	96 17 34	2991	94 47 10	3008	93 17 7	3025
22	Jupiter	W.	82 54 3	2748	84 29 39	2763	86 4 56	2777	87 39 54	2790
	Spica	W.	58 34 5	2801	60 8 31	2815	61 42 39	2828	63 16 30	2842
	α Aquilæ	E.	44 37 28	3841	43 23 8	3920	42 10 9	4006	40 58 35	4100
	Fomalhaut	E.	75 3 5	3140	73 35 44	3160	72 8 47	3181	70 42 15	3203
	Venus	E.	85 52 0	3106	84 23 58	3122	82 56 15	3138	81 28 51	3153
	α Pegasi	E.	89 39 38	3046	88 10 22	3061	86 41 25	3076	85 12 46	3091
	Sun	E.	131 36 23	3141	130 9 3	3156	128 42 1	3170	127 15 16	3185
23	Jupiter	W.	95 30 23	2855	97 3 39	2868	98 36 39	2880	100 9 24	2891
	Spica	W.	71 1 32	2905	72 33 44	2916	74 5 42	2928	75 37 25	2939
	Antares	W.	26 32 46	3198	27 58 57	3180	29 25 30	3167	30 52 19	3157
	Fomalhaut	E.	63 36 4	3315	62 12 10	3340	60 48 45	3365	59 25 49	3392
	Venus	E.	74 16 21	3226	72 50 43	3239	71 25 20	3252	70 0 12	3265
	α Pegasi	E.	77 54 12	3169	76 27 26	3184	75 0 58	3200	73 34 49	3217
	Sun	E.	120 5 48	3254	118 40 43	3267	117 15 53	3280	115 51 18	3292
24	Spica	W.	83 12 36	2991	84 43 0	3000	86 13 13	3008	87 43 16	3017
	Antares	W.	38 8 38	3134	39 36 6	3133	41 3 35	3133	42 31 5	3133
	Fomalhaut	E.	52 38 56	3538	51 19 14	3572	50 0 9	3608	48 41 43	3646
	Venus	E.	62 58 10	3323	61 34 25	3333	60 10 52	3344	58 47 31	3353
	α Pegasi	E.	66 28 58	3300	65 4 47	3318	63 40 56	3335	62 17 25	3352
	Sun	E.	108 51 46	3347	107 28 29	3358	106 5 24	3367	104 42 30	3376
25	Antares	W.	49 48 17	3139	51 15 39	3141	52 42 59	3142	54 10 18	3143
	Fomalhaut	E.	42 20 29	3875	41 6 44	3933	39 53 58	3997	38 42 15	4065
	Venus	E.	51 53 17	3393	50 30 52	3399	49 8 34	3405	47 46 23	3411
	α Pegasi	E.	55 25 10	3451	54 3 51	3472	52 42 56	3495	51 22 26	3519
	Sun	E.	97 50 22	3414	96 28 21	3420	95 6 27	3426	93 44 40	3431
26	Antares	W.	61 26 38	3146	62 53 52	3145	64 21 7	3143	65 48 24	3143
	Venus	E.	40 56 51	3430	39 35 8	3432	38 13 28	3434	36 51 50	3435
	α Pegasi	E.	44 47 2	3663	43 29 34	3697	42 12 44	3736	40 56 35	3777
	Sun	E.	86 56 56	3448	85 35 34	3450	84 14 14	3452	82 52 56	3453
27	Antares	W.	73 5 11	3133	74 32 40	3130	76 0 13	3127	77 27 50	3123
	α Aquilæ	W.	33 40 18	5022	34 36 56	4874	35 35 32	4749	36 35 56	4623
	Sun	E.	76 6 30	3450	74 45 10	3448	73 23 48	3446	72 2 23	3442
28	Antares	W.	84 47 13	3099	86 15 24	3093	87 43 42	3087	89 12 8	3080
	α Aquilæ	W.	42 0 46	4177	43 9 34	4109	44 19 27	4046	45 30 21	3988
	Sun	E.	65 14 14	3420	63 52 20	3415	62 30 20	3408	61 8 13	3401
29	Antares	W.	96 36 23	3043	98 5 42	3035	99 35 11	3027	101 4 50	3019
	α Aquilæ	W.	51 38 5	3752	52 53 57	3714	54 10 29	3677	55 27 40	3642
	Sun	E.	54 15 37	3364	52 52 39	3355	51 29 31	3346	50 6 13	3338
30	Antares	W.	108 35 48	2973	110 6 34	2964	111 37 32	2954	113 8 42	2944
	α Aquilæ	W.	62 2 27	3492	63 23 0	3465	64 44 3	3440	66 5 34	3415
	Sun	E.	43 7 1	3288	41 42 36	3279	40 18 0	3269	38 53 12	3259

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21	Fomalhaut	E.	80° 56′ 22″	3064	79° 27′ 28″	3082	77° 58′ 57″	3101	76° 30′ 49″	3121
	VENUS	E.	91 47 25	3041	90 18 3	3058	88 49 2	3074	87 20 21	3091
22	JUPITER	W.	89 14 35	2804	90 48 58	2818	92 23 3	2831	93 56 51	2843
	Spica	W.	64 50 3	2855	66 23 20	2868	67 56 20	2880	69 29 4	2893
	α Aquilæ	E.	39 48 33	4201	38 40 8	4313	37 33 27	4436	36 28 38	4571
	Fomalhaut	E.	69 16 9	3924	67 50 28	3946	66 25 13	3969	65 0 25	3992
	VENUS	E.	80 1 45	3168	78 34 58	3183	77 8 28	3198	75 42 16	3212
	α Pegasi	E.	83 44 26	3106	82 16 24	3122	80 48 41	3138	79 21 17	3153
	SUN	E.	125 48 49	3199	124 22 39	3214	122 56 46	3227	121 31 9	3241
23	JUPITER	W.	101 41 54	2902	103 14 10	2913	104 46 12	2924	106 18 0	2934
	Spica	W.	77 8 54	2950	78 40 9	2961	80 11 11	2971	81 42 0	2981
	Antares	W.	32 19 20	3148	33 46 31	3143	35 13 49	3138	36 41 12	3136
	Fomalhaut	E.	58 3 23	3419	56 41 28	3446	55 20 4	3476	53 59 13	3506
	VENUS	E.	68 35 19	3277	67 10 41	3289	65 46 17	3301	64 22 7	3313
	α Pegasi	E.	72 9 0	3233	70 43 30	3250	69 18 20	3266	67 53 29	3283
	SUN	E.	114 26 57	3304	113 2 50	3315	111 38 56	3326	110 15 15	3337
24	Spica	W.	89 13 8	3025	90 42 50	3032	92 12 23	3039	93 41 47	3045
	Antares	W.	43 58 34	3134	45 26 2	3135	46 53 29	3137	48 20 54	3138
	Fomalhaut	E.	47 23 58	3686	46 6 56	3727	44 50 38	3773	43 35 8	3822
	VENUS	E.	57 24 21	3362	56 1 21	3371	54 38 31	3379	53 15 50	3386
	α Pegasi	E.	60 54 14	3371	59 31 25	3391	58 8 58	3410	56 46 53	3430
	SUN	E.	103 19 46	3384	101 57 11	3393	100 34 46	3400	99 12 30	3408
25	Antares	W.	55 37 36	3143	57 4 53	3144	58 32 9	3145	59 59 24	3146
	Fomalhaut	E.	37 31 39	4141	36 22 17	4224	35 14 14	4318	34 7 38	4422
	VENUS	E.	46 24 19	3415	45 2 20	3420	43 40 26	3424	42 18 37	3427
	α Pegasi	E.	50 2 23	3545	48 42 48	3571	47 23 42	3598	46 5 6	3626
	SUN	E.	92 22 58	3435	91 1 21	3439	89 39 49	3443	88 18 21	3446
26	Antares	W.	67 15 42	3142	68 43 1	3140	70 10 22	3138	71 37 45	3136
	VENUS	E.	35 30 13	3436	34 8 37	3436	32 47 1	3436	31 25 25	3434
	α Pegasi	E.	39 41 9	3853	38 26 31	3874	37 12 45	3899	35 59 55	3922
	SUN	E.	81 31 39	3453	80 10 22	3453	78 49 5	3453	77 27 48	3452
27	Antares	W.	78 55 32	3119	80 23 19	3114	81 51 11	3110	83 19 9	3105
	α Aquilæ	W.	37 38 1	4516	38 41 39	4419	39 46 43	4331	40 53 7	4250
	SUN	E.	70 40 54	3438	69 19 21	3435	67 57 44	3431	66 36 2	3428
28	Antares	W.	90 40 42	3073	92 9 24	3066	93 38 15	3060	95 7 14	3052
	α Aquilæ	W.	46 42 12	3934	47 54 57	3884	49 8 33	3838	50 22 56	3793
	SUN	E.	59 45 58	3394	58 23 35	3387	57 1 4	3380	55 38 25	3372
29	Antares	W.	102 34 39	3010	104 4 39	3001	105 34 51	2992	107 5 14	2983
	α Aquilæ	W.	56 45 29	3610	58 3 53	3577	59 22 52	3547	60 42 24	3519
	SUN	E.	48 42 45	3328	47 19 6	3319	45 55 16	3308	44 31 14	3299
30	Antares	W.	114 40 3	2935	116 11 37	2926	117 43 23	2917	119 15 20	2909
	α Aquilæ	W.	67 27 33	3392	68 49 59	3370	70 12 50	3348	71 36 6	3327
	SUN	E.	37 28 12	3288	36 3 0	3278	34 37 36	3269	33 12 1	3260

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sat.	1	2 34 18.12	9.548	N. 15 8 9.6	+45.26	15 54.18	66.07	3 2.45	0.307
SUN.	2	2 38 7.56	9.571	15 26 8.3	44.63	15 53.94	66.15	3 9.55	0.284
Mon.	3	2 41 57.55	9.594	15 43 51.8	43.99	15 53.71	66.23	3 16.10	0.261
Tues.	4	2 45 48.09	9.617	16 1 19.7	+43.33	15 53.48	66.31	3 22.09	0.238
Wed.	5	2 49 39.19	9.640	16 18 31.6	42.66	15 53.25	66.39	3 27.53	0.215
Thur.	6	2 53 30.85	9.664	16 35 27.3	41.98	15 53.03	66.47	3 32.41	0.191
Frid.	7	2 57 23.06	9.688	16 52 6.5	+41.28	15 52.81	66.55	3 36.74	0.168
Sat.	8	3 1 15.83	9.711	17 8 28.8	40.57	15 52.60	66.64	3 40.51	0.145
SUN.	9	3 5 9.16	9.734	17 24 34.0	39.85	15 52.39	66.72	3 43.73	0.122
Mon.	10	3 9 3.04	9.757	17 40 21.7	+39.12	15 52.18	66.80	3 46.39	0.099
Tues.	11	3 12 57.48	9.780	17 55 51.7	38.37	15 51.98	66.88	3 48.50	0.076
Wed.	12	3 16 52.48	9.803	18 11 3.7	37.61	15 51.78	66.97	3 50.06	0.053
Thur.	13	3 20 48.04	9.826	18 25 57.1	+36.83	15 51.58	67.05	3 51.06	0.030
Frid.	14	3 24 44.15	9.850	18 40 31.9	36.05	15 51.39	67.13	3 51.49	0.006
Sat.	15	3 28 40.82	9.873	18 54 47.8	35.25	15 51.19	67.21	3 51.37	0.017
SUN.	16	3 32 38.06	9.897	19 8 44.6	+34.45	15 51.00	67.30	3 50.69	0.041
Mon.	17	3 36 35.85	9.920	19 22 21.9	33.63	15 50.81	67.38	3 49.46	0.064
Tues.	18	3 40 34.20	9.943	19 35 39.6	32.81	15 50.62	67.46	3 47.67	0.087
Wed.	19	3 44 33.11	9.966	19 48 37.3	+31.97	15 50.43	67.54	3 45.32	0.110
Thur.	20	3 48 32.58	9.989	20 1 14.8	31.13	15 50.25	67 61	3 42.42	0.133
Frid.	21	3 52 32.60	10.012	20 13 31.7	30.27	15 50.07	67.69	3 38.97	0.156
Sat.	22	3 56 33.16	10.035	20 25 28.0	+29.41	15 49.89	67.76	3 34.97	0.178
SUN.	23	4 0 34.27	10.056	20 37 3.5	28.54	15 49.71	67.84	3 30.43	0.201
Mon.	24	4 4 35.92	10.080	20 48 17.8	27.65	15 49.54	67.91	3 25.35	0.223
Tues.	25	4 8 38.09	10.102	20 59 10.7	+26.75	15 49.37	67.99	3 19.75	0.245
Wed.	26	4 12 40.78	10.123	21 9 41.9	25.84	15 49.21	68.05	3 13.63	0.266
Thur.	27	4 16 43.98	10.144	21 19 51.3	24.93	15 49.05	68.12	3 7.01	0.287
Frid.	28	4 20 47.68	10.164	21 29 38.7	+24.01	15 48.89	68.18	2 59.89	0.307
Sat.	29	4 24 51.84	10.183	21 39 3.9	23.08	15 48.74	68.24	2 52.30	0.326
SUN.	30	4 28 56.46	10.202	21 48 6.6	22.14	15 48.59	68.30	2 44.25	0.345
Mon.	31	4 33 1.53	10.220	21 56 46.6	21.19	15 48.44	68.36	2 35.76	0.363
Tues.	32	4 37 7.03	10.237	N. 22 5 3.7	+20.23	15 48.30	68.42	2 26.84	0.380

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^{s}.18$ from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Sat.	1	2 34 18.60	9.549	N. 15 8 11.9	+45.26	3 2.48	0.307	2 37 21.08
SUN.	2	2 38 8.06	9.572	15 26 10.6	44.63	3 9.57	0.284	2 41 17.63
Mon.	3	2 41 58.07	9.595	15 43 54.1	43.99	3 16.11	0.261	2 45 14.18
Tues.	4	2 45 48.63	9.618	16 1 22.1	+43.33	3 22.10	0.238	2 49 10.73
Wed.	5	2 49 39.75	9.641	16 18 34.1	42.66	3 27.54	0.215	2 53 7.29
Thur.	6	2 53 31.43	9.665	16 35 29.8	41.98	3 32.42	0.191	2 57 3.84
Frid.	7	2 57 23.65	9.688	16 52 9.0	+41.28	3 36.75	0.168	3 1 0.40
Sat.	8	3 1 16.43	9.711	17 8 31.3	40.57	3 40.52	0.145	3 4 56.95
SUN.	9	3 5 9.77	9.734	17 24 36.5	39.85	3 43.74	0.122	3 8 53.51
Mon.	10	3 9 3.66	9.757	17 40 24.2	+39.12	3 46.40	0.099	3 12 50.06
Tues.	11	3 12 58.11	9.780	17 55 54.2	38.37	3 48.51	0.076	3 16 46.62
Wed.	12	3 16 53.11	9.803	18 11 6.1	37.61	3 50.06	0.053	3 20 43.17
Thur.	13	3 20 48.67	9.826	18 25 59.5	+36.83	3 51.06	0.030	3 24 39.73
Frid.	14	3 24 44.79	9.850	18 40 34.2	36.05	3 51.49	0.006	3 28 36.28
Sat.	15	3 28 41.46	9.873	18 54 50.1	35.25	3 51.37	0.017	3 32 32.84
SUN.	16	3 32 38.70	9.897	19 8 46.8	+34.45	3 50.69	0.041	3 36 29.39
Mon.	17	3 36 36.49	9.920	19 22 24.1	33.63	3 49.46	0.064	3 40 25.95
Tues.	18	3 40 34.83	9.943	19 35 41.7	32.81	3 47.67	0.087	3 44 22.50
Wed.	19	3 44 33.74	9.966	19 48 39.3	+31.97	3 45.32	0.110	3 48 19.06
Thur.	20	3 48 33.20	9.989	20 1 16.7	31.13	3 42.41	0.133	3 52 15.61
Frid.	21	3 52 33.21	10.012	20 13 33.6	30.27	3 38.96	0.156	3 56 12.17
Sat.	22	3 56 33.76	10.034	20 25 29.8	+29.41	3 34.96	0.178	4 0 8.72
SUN.	23	4 0 34.86	10.057	20 37 5.2	28.54	3 30.42	0.201	4 4 5.28
Mon.	24	4 4 36.50	10.079	20 48 19.4	27.65	3 25.34	0.223	4 8 1.84
Tues.	25	4 8 38.66	10.101	20 59 12.2	+26.75	3 19.74	0.245	4 11 58.40
Wed.	26	4 12 41.33	10.122	21 9 43.3	25.84	3 13.62	0.266	4 15 54.95
Thur.	27	4 16 44.51	10.143	21 19 52.6	24.93	3 7.00	0.287	4 19 51.51
Frid.	28	4 20 48.19	10.163	21 29 39.9	+24.01	2 59.88	0.307	4 23 48.06
Sat.	29	4 24 52.33	10.182	21 39 5.0	23.08	2 52.29	0.326	4 27 44.62
SUN.	30	4 28 56.93	10.201	21 48 7.6	22.14	2 44.24	0.345	4 31 41.17
Mon.	31	4 33 1.98	10.219	21 56 47.5	21.19	2 35.75	0.363	4 35 37.73
Tues.	32	4 37 7.46	10.236	N. 22 5 4.5	+20.23	2 26.83	0.380	4 39 34.29

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour,
+ 9s.8565.
(Table III.)

AT GREENWICH MEAN NOON.								Mean Time of Sidereal Noon.
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	121	41 0 41.5	0 31.1	145.49	− 0.62	0.0035468	+ 45.3	21 19 8.80
2	122	41 58 52.4	58 41.9	145.42	0.72	0.0036546	44.6	21 15 12.89
3	123	42 57 1.6	56 51.0	145.35	0.81	0.0037608	43.9	21 11 16.99
4	124	43 55 9.2	54 58.4	145.28	− 0.87	0.0038652	+ 43.2	21 7 21.08
5	125	44 53 15.1	53 4.2	145.21	0.90	0.0039678	42.5	21 3 25.17
6	126	45 51 19.3	51 8.3	145.14	0.89	0.0040687	41.7	20 59 29.26
7	127	46 49 21.7	49 10.6	145.06	− 0.85	0.0041678	+ 41.0	20 55 33.35
8	128	47 47 22.3	47 11.1	144.98	0.79	0.0042652	40.3	20 51 37.44
9	129	48 45 21.0	45 9.7	144.90	0.71	0.0043611	39.7	20 47 41.53
10	130	49 43 17.9	43 6.4	144.83	− 0.60	0.0044555	+ 39.1	20 43 45.62
11	131	50 41 12.9	41 1.3	144.75	0.47	0.0045485	38.5	20 39 49.71
12	132	51 39 6.1	38 54.4	144.68	0.33	0.0046402	38.0	20 35 53.80
13	133	52 36 57.6	36 45.7	144.61	− 0.19	0.0047307	+ 37.5	20 31 57.89
14	134	53 34 47.3	34 35.3	144.54	− 0.05	0.0048200	37.0	20 28 1.98
15	135	54 32 35.4	32 23.3	144.47	+ 0.07	0.0049083	36.6	20 24 6.08
16	136	55 30 21.9	30 9.6	144.40	+ 0.17	0.0049957	+ 36.2	20 20 10.17
17	137	56 28 6.9	27 54.5	144.34	0.25	0.0050822	35.8	20 16 14.26
18	138	57 25 50.5	25 38.0	144.28	0.30	0.0051679	35.5	20 12 18.35
19	139	58 23 32.7	23 20.0	144.23	+ 0.31	0.0052526	+ 35.1	20 8 22.44
20	140	59 21 13.6	21 0.7	144.18	0.30	0.0053363	34.7	20 4 26.53
21	141	60 18 53.4	18 40.4	144.13	0.26	0.0054190	34.3	20 0 30.62
22	142	61 16 32.1	16 19.0	144.09	+ 0.20	0.0055007	+ 33.8	19 56 34.71
23	143	62 14 9.7	13 56.4	144.05	+ 0.11	0.0055811	33.2	19 52 38.80
24	144	63 11 46.2	11 32.8	144.01	0.00	0.0056601	32.6	19 48 42.89
25	145	64 9 21.8	9 8.3	143.97	− 0.12	0.0057377	+ 32.0	19 44 46.98
26	146	65 6 56.6	6 43.0	143.93	0.25	0.0058137	31.3	19 40 51.07
27	147	66 4 30.6	4 16.8	143.89	0.38	0.0058879	30.5	19 36 55.16
28	148	67 2 3.7	1 49.8	143.86	− 0.50	0.0059602	+ 29.7	19 32 59.25
29	149	67 59 35.9	59 21.8	143.82	0.61	0.0060304	28.8	19 29 3.34
30	150	68 57 7.3	56 53.0	143.79	0.70	0.0060984	27.9	19 25 7.43
31	151	69 54 37.7	54 23.3	143.75	0.76	0.0061641	26.9	19 21 11.52
32	152	70 52 7.2	51 52.6	143.71	− 0.79	0.0062275	+ 25.9	19 17 15.60
NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0ᵈ.0.								Diff. for 1 Hour, — 9ˢ.8296. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 11.1	15 15.8	55 37.0	+1.39	55 54.2	+1.46	22 42.1	1.94	26.9
2	15 20.7	15 25.6	56 12.1	1.51	56 30.3	1.52	23 29.6	2.03	27.9
3	15 30.6	15 35.5	56 48.5	1.51	57 6.4	1.47	☌		28.9
4	15 40.2	15 44.7	57 23.8	+1.42	57 40.4	+1.34	0 19.6	2.14	0.4
5	15 49.0	15 52.9	57 56.0	1.25	58 10.3	1.14	1 12.2	2.25	1.4
6	15 56.4	15 59.6	58 23.3	1.03	58 34.9	0.91	2 7.2	2.34	2.4
7	16 2.3	16 4.7	58 45.1	+0.78	58 53.7	+0.66	3 3.9	2.39	3.4
8	16 6.6	16 8.2	59 0.9	0.54	59 6.7	0.43	4 1.4	2.39	4.4
9	16 9.4	16 10.3	59 11.2	0.32	59 14.3	+0.21	4 58.5	2.36	5.4
10	16 10.8	16 11.0	59 16.2	+0.10	59 16.8	0.00	5 54.4	2.29	6.4
11	16 10.8	16 10.3	59 16.3	−0.10	59 14.5	−0.20	6 48.7	2.23	7.4
12	16 9.5	16 8.4	59 11.5	0.30	59 7.2	0.41	7 41.4	2.17	8.4
13	16 6.8	16 4.9	59 1.6	−0.53	58 54.6	−0.64	8 32.9	2.13	9.4
14	16 2.7	16 0.0	58 46.3	0.75	58 36.5	0.88	9 23.8	2.11	10.4
15	15 56.9	15 53.5	58 25.3	0.99	58 12.7	1.10	10 14.5	2.12	11.4
16	15 49.7	15 45.6	57 58.7	−1.21	57 43.6	−1.30	11 5.5	2.14	12.4
17	15 41.2	15 36.6	57 27.5	1.38	57 10.5	1.44	11 57.0	2.15	13.4
18	15 31.8	15 26.9	56 52.9	1.48	56 34.9	1.50	12 48.6	2.15	14.4
19	15 22.0	15 17.2	56 16.9	−1.49	55 59.2	−1.46	13 40.1	2.13	15.4
20	15 12.5	15 8.0	55 42.0	1.40	55 25.6	1.32	14 30.9	2.09	16.4
21	15 3.9	15 0.1	55 10.3	1.21	54 56.5	1.08	15 20.4	2.03	17.4
22	14 56.8	14 53.9	54 44.3	−0.94	54 33.9	−0.78	16 8.3	1.96	18.4
23	14 51.7	14 50.1	54 25.7	0.59	54 19.7	−0.40	16 54.5	1.89	19.4
24	14 49.1	14 48.8	54 16.1	−0.20	54 14.9	+0.01	17 39.2	1.84	20.4
25	14 49.2	14 50.2	54 16.3	+0.22	54 20.3	+0.44	18 22.9	1.80	21.4
26	14 52.0	14 54.5	54 26.9	0.65	54 36.0	0.86	19 6.2	1.80	22.4
27	14 57.7	15 1.4	54 47.5	1.06	55 1.3	1.24	19 49.7	1.83	23.4
28	15 5.8	15 10.6	55 17.3	+1.41	55 35.2	+1.56	20 34.2	1.89	24.4
29	15 16.0	15 21.7	55 54.8	1.69	56 15.7	1.78	21 20.5	1.98	25.4
30	15 27.6	15 33.7	56 37.6	1.85	57 0.0	1.88	22 9.3	2.10	26.4
31	15 39.9	15 46.0	57 22.6	1.88	57 45.0	1.83	23 1.2	2.23	27.4
32	15 51.9	15 57.4	58 6.6	+1.75	58 27.0	+1.63	23 56.0	2.35	28.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 37 29.85	1.9831	N. 1 44 33.0	9.939
1	0 39 28.90	1.9853	1 54 29.4	9.941
2	0 41 28.09	1.9876	2 4 25.9	9.942
3	0 43 27.41	1.9898	2 14 22.4	9.941
4	0 45 26.86	1.9920	2 24 18.8	9.940
5	0 47 26.45	1.9944	2 34 15.2	9.939
6	0 49 26.19	1.9968	2 44 11.5	9.937
7	0 51 26.07	1.9992	2 54 7.6	9.933
8	0 53 26.10	2.0017	3 4 3.4	9.928
9	0 55 26.27	2.0041	3 13 59.0	9.924
10	0 57 26.59	2.0067	3 23 54.3	9.918
11	0 59 27.07	2.0092	3 33 49.2	9.912
12	1 1 27.70	2.0118	3 43 43.7	9.905
13	1 3 28.49	2.0145	3 53 37.8	9.897
14	1 5 29.44	2.0172	4 3 31.3	9.888
15	1 7 30.56	2.0200	4 13 24.3	9.878
16	1 9 31.84	2.0227	4 23 16.7	9.868
17	1 11 33.29	2.0255	4 33 8.4	9.857
18	1 13 34.90	2.0283	4 42 59.5	9.845
19	1 15 36.69	2.0312	4 52 49.8	9.832
20	1 17 38.65	2.0342	5 2 39.3	9.818
21	1 19 40.79	2.0372	5 12 28.0	9.804
22	1 21 43.11	2.0402	5 22 15.8	9.788
23	1 23 45.61	2.0432	N. 5 32 2.6	9.772

SUNDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 25 48.29	2.0463	N. 5 41 48.4	9.755
1	1 27 51.16	2.0493	5 51 33.2	9.737
2	1 29 54.21	2.0524	6 1 16.9	9.718
3	1 31 57.45	2.0556	6 10 59.4	9.698
4	1 34 0.89	2.0589	6 20 40.7	9.677
5	1 36 4.52	2.0621	6 30 20.7	9.656
6	1 38 8.34	2.0653	6 39 59.4	9.633
7	1 40 12.36	2.0687	6 49 36.7	9.610
8	1 42 16.58	2.0721	6 59 12.6	9.587
9	1 44 21.01	2.0755	7 8 47.1	9.562
10	1 46 25.64	2.0788	7 18 20.1	9.536
11	1 48 30.47	2.0822	7 27 51.4	9.509
12	1 50 35.50	2.0856	7 37 21.1	9.481
13	1 52 40.74	2.0891	7 46 49.1	9.452
14	1 54 46.20	2.0927	7 56 15.4	9.423
15	1 56 51.87	2.0962	8 5 39.9	9.392
16	1 58 57.75	2.0998	8 15 2.5	9.361
17	2 1 3.85	2.1034	8 24 23.2	9.328
18	2 3 10.16	2.1070	8 33 41.9	9.295
19	2 5 16.69	2.1107	8 42 58.6	9.261
20	2 7 23.45	2.1145	8 52 13.2	9.226
21	2 9 30.43	2.1182	9 1 25.7	9.189
22	2 11 37.63	2.1219	9 10 35.9	9.152
23	2 13 45.06	2.1257	9 19 43.9	9.114
24	2 15 52.71	2.1294	N. 9 28 49.6	9.075

MONDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 15 52.71	2.1294	N. 9 28 49.6	9.075
1	2 18 0.59	2.1332	9 37 52.9	9.035
2	2 20 8.70	2.1371	9 46 53.8	8.993
3	2 22 17.04	2.1409	9 55 52.1	8.951
4	2 24 25.61	2.1448	10 4 47.9	8.908
5	2 26 34.42	2.1487	10 13 41.1	8.865
6	2 28 43.46	2.1527	10 22 31.7	8.820
7	2 30 52.74	2.1566	10 31 19.5	8.774
8	2 33 2.25	2.1606	10 40 4.5	8.727
9	2 35 12.00	2.1645	10 48 46.7	8.679
10	2 37 21.99	2.1685	10 57 26.0	8.630
11	2 39 32.22	2.1725	11 6 2.3	8.579
12	2 41 42.69	2.1765	11 14 35.5	8.528
13	2 43 53.40	2.1805	11 23 5.7	8.477
14	2 46 4.35	2.1846	11 31 32.7	8.423
15	2 48 15.55	2.1887	11 39 56.5	8.369
16	2 50 26.99	2.1927	11 48 17.0	8.314
17	2 52 38.67	2.1968	11 56 34.2	8.258
18	2 54 50.60	2.2009	12 4 48.0	8.201
19	2 57 2.78	2.2050	12 12 58.3	8.143
20	2 59 15.20	2.2091	12 21 5.1	8.084
21	3 1 27.87	2.2132	12 29 8.4	8.024
22	3 3 40.78	2.2173	12 37 8.0	7.962
23	3 5 53.94	2.2214	N.12 45 3.9	7.900

TUESDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	3 8 7.35	2.2256	N.12 52 56.0	7.837
1	3 10 21.01	2.2297	13 0 44.3	7.773
2	3 12 34.91	2.2338	13 8 28.7	7.708
3	3 14 49.06	2.2379	13 16 9.2	7.642
4	3 17 3.46	2.2420	13 23 45.7	7.574
5	3 19 18.10	2.2461	13 31 18.1	7.506
6	3 21 32.99	2.2502	13 38 46.4	7.437
7	3 23 48.13	2.2544	13 46 10.5	7.367
8	3 26 3.52	2.2585	13 53 30.4	7.295
9	3 28 19.15	2.2625	14 0 45.9	7.222
10	3 30 35.02	2.2666	14 7 57.0	7.149
11	3 32 51.14	2.2707	14 15 3.7	7.075
12	3 35 7.51	2.2748	14 22 6.0	7.000
13	3 37 24.12	2.2788	14 29 3.7	6.923
14	3 39 40.97	2.2829	14 35 56.8	6.846
15	3 41 58.07	2.2870	14 42 45.2	6.767
16	3 44 15.41	2.2909	14 49 28.9	6.688
17	3 46 32.98	2.2949	14 56 7.8	6.607
18	3 48 50.80	2.2990	15 2 41.8	6.526
19	3 51 8.86	2.3029	15 9 10.9	6.444
20	3 53 27.15	2.3068	15 15 35.1	6.362
21	3 55 45.68	2.3108	15 21 54.3	6.278
22	3 58 4.45	2.3147	15 28 8.4	6.193
23	4 0 23.45	2.3186	15 34 17.4	6.106
24	4 2 42.68	2.3225	N.15 40 21.2	6.019

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 2 42.68	2.3225	N.15 40 21.2	6.019
1	4 5 2.15	2.3263	15 46 19.7	5.932
2	4 7 21.84	2.3301	15 52 13.0	5.843
3	4 9 41.76	2.3338	15 58 0.9	5.753
4	4 12 1.90	2.3376	16 3 43.4	5.662
5	4 14 22.27	2.3413	16 9 20.4	5.571
6	4 16 42.86	2.3450	16 14 51.9	5.478
7	4 19 3.67	2.3487	16 20 17.8	5.385
8	4 21 24.70	2.3523	16 25 38.1	5.292
9	4 23 45.94	2.3558	16 30 52.8	5.198
10	4 26 7.40	2.3594	16 36 1.8	5.102
11	4 28 29.07	2.3629	16 41 5.0	5.004
12	4 30 50.95	2.3664	16 46 2.3	4.906
13	4 33 13.04	2.3698	16 50 53.7	4.808
14	4 35 35.33	2.3732	16 55 39.3	4.710
15	4 37 57.82	2.3765	17 0 18.9	4.609
16	4 40 20.51	2.3798	17 4 52.4	4.508
17	4 42 43.40	2.3832	17 9 19.9	4.407
18	4 45 6.49	2.3864	17 13 41.3	4.305
19	4 47 29.77	2.3895	17 17 56.5	4.202
20	4 49 53.23	2.3926	17 22 5.5	4.097
21	4 52 16.88	2.3957	17 26 8.2	3.992
22	4 54 40.71	2.3987	17 30 4.6	3.887
23	4 57 4.72	2.4017	N.17 33 54.7	3.782

THURSDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	4 59 28.91	2.4046	N.17 37 38.5	3.676
1	5 1 53.27	2.4074	17 41 15.8	3.568
2	5 4 17.80	2.4102	17 44 46.6	3.459
3	5 6 42.50	2.4130	17 48 10.9	3.351
4	5 9 7.36	2.4157	17 51 28.7	3.242
5	5 11 32.38	2.4183	17 54 40.0	3.133
6	5 13 57.56	2.4209	17 57 44.7	3.022
7	5 16 22.89	2.4234	18 0 42.7	2.911
8	5 18 48.37	2.4259	18 3 34.0	2.799
9	5 21 14.00	2.4283	18 6 18.6	2.687
10	5 23 39.77	2.4306	18 8 56.4	2.574
11	5 26 5.67	2.4328	18 11 27.5	2.461
12	5 28 31.71	2.4351	18 13 51.8	2.347
13	5 30 57.88	2.4372	18 16 9.2	2.232
14	5 33 24.18	2.4393	18 18 19.7	2.118
15	5 35 50.60	2.4413	18 20 23.4	2.003
16	5 38 17.14	2.4432	18 22 20.1	1.888
17	5 40 43.79	2.4451	18 24 9.9	1.773
18	5 43 10.55	2.4469	18 25 52.8	1.656
19	5 45 37.42	2.4487	18 27 28.7	1.539
20	5 48 4.39	2.4504	18 28 57.5	1.422
21	5 50 31.46	2.4520	18 30 19.3	1.304
22	5 52 58.63	2.4536	18 31 34.0	1.186
23	5 55 25.89	2.4551	18 32 41.6	1.068
24	5 57 53.24	2.4565	N.18 33 42.2	0.950

FRIDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	5 57 53.24	2.4565	N.18 33 42.2	0.950
1	6 0 20.67	2.4578	18 34 35.6	0.831
2	6 2 48.17	2.4590	18 35 21.9	0.712
3	6 5 15.75	2.4602	18 36 1.1	0.593
4	6 7 43.40	2.4613	18 36 33.1	0.474
5	6 10 11.11	2.4623	18 36 58.0	0.355
6	6 12 38.88	2.4633	18 37 15.7	0.235
7	6 15 6.71	2.4642	18 37 26.2	+ 0.115
8	6 17 34.59	2.4651	18 37 29.5	− 0.005
9	6 20 2.52	2.4659	18 37 25.6	0.125
10	6 22 30.50	2.4666	18 37 14.5	0.245
11	6 24 58.51	2.4672	18 36 56.2	0.366
12	6 27 26.56	2.4677	18 36 30.6	0.487
13	6 29 54.64	2.4682	18 35 57.8	0.607
14	6 32 22.74	2.4686	18 35 17.8	0.727
15	6 34 50.87	2.4689	18 34 30.6	0.847
16	6 37 19.01	2.4692	18 33 36.1	0.968
17	6 39 47.17	2.4694	18 32 34.4	1.088
18	6 42 15.34	2.4695	18 31 25.5	1.208
19	6 44 43.51	2.4695	18 30 9.4	1.328
20	6 47 11.68	2.4695	18 28 46.1	1.449
21	6 49 39.85	2.4695	18 27 15.5	1.570
22	6 52 8.02	2.4693	18 25 37.7	1.689
23	6 54 36.17	2.4690	N.18 23 52.8	1.808

SATURDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	6 57 4.30	2.4687	N.18 22 0.7	1.928
1	6 59 32.41	2.4683	18 20 1.4	2.047
2	7 2 0.50	2.4679	18 17 55.0	2.167
3	7 4 28.56	2.4674	18 15 41.4	2.286
4	7 6 56.59	2.4668	18 13 20.7	2.405
5	7 9 24.58	2.4662	18 10 52.8	2.524
6	7 11 52.54	2.4656	18 8 17.8	2.642
7	7 14 20.45	2.4648	18 5 35.8	2.759
8	7 16 48.31	2.4639	18 2 46.7	2.877
9	7 19 16.12	2.4631	17 59 50.5	2.995
10	7 21 43.88	2.4622	17 56 47.3	3.112
11	7 24 11.58	2.4612	17 53 37.1	3.228
12	7 26 39.22	2.4601	17 50 20.0	3.343
13	7 29 6.79	2.4589	17 46 55.9	3.459
14	7 31 34.29	2.4578	17 43 24.9	3.575
15	7 34 1.72	2.4566	17 39 46.9	3.690
16	7 36 29.08	2.4552	17 36 2.1	3.804
17	7 38 56.35	2.4538	17 32 10.4	3.918
18	7 41 23.54	2.4524	17 28 11.9	4.032
19	7 43 50.64	2.4509	17 24 6.6	4.144
20	7 46 17.65	2.4495	17 19 54.6	4.257
21	7 48 44.58	2.4480	17 15 35.8	4.369
22	7 51 11.41	2.4464	17 11 10.3	4.480
23	7 53 38.14	2.4447	17 6 38.2	4.590
24	7 56 4.77	2.4429	N.17 1 59.5	4.700

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	7 56 4.77	2.4429	N.17 1 59.5	4.700
1	7 58 31.29	2.4412	16 57 14.2	4.810
2	8 0 57.71	2.4394	16 52 22.3	4.919
3	8 3 24.02	2.4376	16 47 23.9	5.027
4	8 5 50.22	2.4357	16 42 19.0	5.135
5	8 8 16.30	2.4337	16 37 7.7	5.243
6	8 10 42.27	2.4318	16 31 49.9	5.350
7	8 13 8.12	2.4298	16 26 25.7	5.455
8	8 15 33.85	2.4277	16 20 55.3	5.559
9	8 17 59.45	2.4256	16 15 18.6	5.663
10	8 20 24.92	2.4235	16 9 35.7	5.767
11	8 22 50.27	2.4214	16 3 46.6	5.870
12	8 25 15.49	2.4192	15 57 51.3	5.972
13	8 27 40.57	2.4169	15 51 49.9	6.073
14	8 30 5.52	2.4147	15 45 42.5	6.173
15	8 32 30.34	2.4125	15 39 29.1	6.273
16	8 34 55.02	2.4102	15 33 9.7	6.372
17	8 37 19.56	2.4078	15 26 44.4	6.471
18	8 39 43.96	2.4054	15 20 13.2	6.568
19	8 42 8.21	2.4030	15 13 36.2	6.664
20	8 44 32.32	2.4007	15 6 53.5	6.760
21	8 46 56.29	2.3983	15 0 5.0	6.856
22	8 49 20.11	2.3958	14 53 10.8	6.949
23	8 51 43.78	2.3933	N.14 46 11.1	7.042

MONDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	8 54 7.30	2.3908	N.14 39 5.8	7.134
1	8 56 30.67	2.3883	14 31 55.0	7.226
2	8 58 53.89	2.3858	14 24 38.7	7.317
3	9 1 16.96	2.3833	14 17 17.0	7.406
4	9 3 39.88	2.3807	14 9 50.0	7.494
5	9 6 2.64	2.3781	14 2 17.7	7.582
6	9 8 25.25	2.3755	13 54 40.2	7.668
7	9 10 47.70	2.3729	13 46 57.5	7.754
8	9 13 10.00	2.3703	13 39 9.7	7.839
9	9 15 32.14	2.3678	13 31 16.8	7.923
10	9 17 54.13	2.3652	13 23 18.9	8.007
11	9 20 15.96	2.3625	13 15 16.0	8.088
12	9 22 37.63	2.3599	13 7 8.3	8.168
13	9 24 59.15	2.3573	12 58 55.8	8.249
14	9 27 20.51	2.3547	12 50 38.4	8.329
15	9 29 41.71	2.3520	12 42 16.3	8.407
16	9 32 2.75	2.3494	12 33 49.6	8.484
17	9 34 23.64	2.3468	12 25 18.3	8.560
18	9 36 44.37	2.3442	12 16 42.4	8.636
19	9 39 4.94	2.3416	12 8 2.0	8.709
20	9 41 25.36	2.3390	11 59 17.3	8.782
21	9 43 45.62	2.3363	11 50 28.2	8.854
22	9 46 5.72	2.3337	11 41 34.8	8.925
23	9 48 25.67	2.3312	11 32 37.2	8.994
24	9 50 45.47	2.3287	N.11 23 35.5	9.063

TUESDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 50 45.47	2.3287	N.11 23 35.5	9.063
1	9 53 5.11	2.3261	11 14 29.6	9.132
2	9 55 24.60	2.3236	11 5 19.7	9.198
3	9 57 43.94	2.3210	10 56 5.8	9.264
4	10 0 3.12	2.3184	10 46 48.0	9.330
5	10 2 22.15	2.3159	10 37 26.3	9.393
6	10 4 41.03	2.3134	10 28 0.9	9.455
7	10 6 59.76	2.3109	10 18 31.7	9.517
8	10 9 18.34	2.3084	10 8 58.8	9.577
9	10 11 36.77	2.3060	9 59 22.4	9.636
10	10 13 55.06	2.3036	9 49 42.5	9.694
11	10 16 13.20	2.3012	9 39 59.1	9.752
12	10 18 31.20	2.2988	9 30 12.2	9.809
13	10 20 49.06	2.2964	9 20 22.0	9.864
14	10 23 6.77	2.2940	9 10 28.5	9.918
15	10 25 24.34	2.2917	9 0 31.8	9.971
16	10 27 41.77	2.2893	8 50 32.0	10.022
17	10 29 59.06	2.2871	8 40 29.2	10.072
18	10 32 16.22	2.2848	8 30 23.4	10.122
19	10 34 33.24	2.2826	8 20 14.6	10.171
20	10 36 50.13	2.2803	8 10 2.9	10.218
21	10 39 6.88	2.2781	7 59 48.4	10.265
22	10 41 23.50	2.2760	7 49 31.1	10.210
23	10 43 40.00	2.2739	N. 7 39 11.2	10.354

WEDNESDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 45 56.37	2.2718	N. 7 28 48.7	10.397
1	10 48 12.62	2.2697	7 18 23.6	10.438
2	10 50 28.74	2.2676	7 7 56.1	10.478
3	10 52 44.73	2.2655	6 57 26.2	10.518
4	10 55 0.60	2.2636	6 46 53.9	10.557
5	10 57 16.36	2.2617	6 36 19.3	10.594
6	10 59 32.00	2.2597	6 25 42.6	10.630
7	11 1 47.53	2.2578	6 15 3.7	10.666
8	11 4 2.94	2.2559	6 4 22.7	10.700
9	11 6 18.24	2.2541	5 53 39.7	10.733
10	11 8 33.43	2.2523	5 42 54.7	10.765
11	11 10 48.51	2.2505	5 32 7.9	10.796
12	11 13 3.49	2.2488	5 21 19.3	10.825
13	11 15 18.37	2.2471	5 10 28.9	10.854
14	11 17 33.14	2.2454	4 59 36.8	10.882
15	11 19 47.81	2.2437	4 48 43.1	10.907
16	11 22 2.38	2.2421	4 37 47.9	10.932
17	11 24 16.86	2.2406	4 26 51.3	10.955
18	11 26 31.25	2.2391	4 15 53.3	10.978
19	11 28 45.55	2.2375	4 4 53.9	11.001
20	11 30 59.75	2.2359	3 53 53.2	11.022
21	11 33 13.86	2.2345	3 42 51.3	11.041
22	11 35 27.89	2.2332	3 31 48.3	11.059
23	11 37 41.84	2.2318	3 20 44.2	11.077
24	11 39 55.71	2.2305	N. 3 9 39.1	11.093

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 39 55.71	2.2305	N. 3 9 39.1	11.093
1	11 42 9.50	2.2292	2 58 33.1	11.108
2	11 44 23.21	2.2279	2 47 26.2	11.122
3	11 46 36.85	2.2266	2 36 18.5	11.135
4	11 48 50.41	2.2254	2 25 10.0	11.147
5	11 51 3.90	2.2243	2 14 0.9	11.157
6	11 53 17.33	2.2232	2 2 51.2	11.167
7	11 55 30.69	2.2222	1 51 40.9	11.175
8	11 57 43.99	2.2211	1 40 30.2	11.182
9	11 59 57.22	2.2201	1 29 19.1	11.188
10	12 2 10.40	2.2192	1 18 7.7	11.193
11	12 4 23.52	2.2183	1 6 56.0	11.197
12	12 6 36.59	2.2174	0 55 44.1	11.199
13	12 8 49.61	2.2165	0 44 32.1	11.201
14	12 11 2.57	2.2156	0 33 20.0	11.202
15	12 13 15.48	2.2147	0 22 7.9	11.202
16	12 15 28.34	2.2140	N. 0 10 55.8	11.200
17	12 17 41.16	2.2133	S. 0 0 16.1	11.197
18	12 19 53.94	2.2127	0 11 27.8	11.193
19	12 22 6.68	2.2120	0 22 39.3	11.188
20	12 24 19.38	2.2113	0 33 50.4	11.182
21	12 26 32.04	2.2107	0 45 1.1	11.175
22	12 28 44.67	2.2102	0 56 11.4	11.167
23	12 30 57.27	2.2097	S. 1 7 21.1	11.157

FRIDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 33 9.83	2.2091	S. 1 18 30.2	11.147
1	12 35 22.36	2.2087	1 29 38.7	11.135
2	12 37 34.87	2.2083	1 40 46.4	11.122
3	12 39 47.36	2.2080	1 51 53.3	11.108
4	12 41 59.83	2.2077	2 2 59.4	11.094
5	12 44 12.28	2.2073	2 14 4.6	11.078
6	12 46 24.71	2.2070	2 25 8.8	11.061
7	12 48 37.12	2.2068	2 36 11.9	11.043
8	12 50 49.52	2.2066	2 47 13.9	11.024
9	12 53 1.91	2.2064	2 58 14.8	11.004
10	12 55 14.29	2.2062	3 9 14.4	10.983
11	12 57 26.66	2.2061	3 20 12.7	10.961
12	12 59 39.02	2.2060	3 31 9.7	10.937
13	13 1 51.38	2.2059	3 42 5.2	10.912
14	13 4 3.73	2.2058	3 52 59.2	10.887
15	13 6 16.08	2.2058	4 3 51.6	10.860
16	13 8 28.43	2.2058	4 14 42.4	10.833
17	13 10 40.78	2.2059	4 25 31.6	10.805
18	13 12 53.14	2.2060	4 36 19.0	10.775
19	13 15 5.50	2.2061	4 47 4.6	10.744
20	13 17 17.87	2.2062	4 57 48.3	10.713
21	13 19 30.25	2.2063	5 8 30.1	10.680
22	13 21 42.63	2.2065	5 19 9.9	10.646
23	13 23 55.03	2.2067	5 29 47.6	10.612
24	13 26 7.44	2.2069	S. 5 40 23.3	10.577

SATURDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 26 7.44	2.2069	S. 5 40 23.3	10.577
1	13 28 19.86	2.2072	5 50 56.8	10.539
2	13 30 32.30	2.2075	6 1 28.0	10.501
3	13 32 44.76	2.2078	6 11 56.9	10.462
4	13 34 57.24	2.2081	6 22 23.4	10.422
5	13 37 9.74	2.2084	6 32 47.5	10.382
6	13 39 22.25	2.2088	6 43 9.2	10.341
7	13 41 34.79	2.2092	6 53 28.4	10.297
8	13 43 47.35	2.2096	7 3 44.9	10.252
9	13 45 59.94	2.2100	7 13 58.7	10.207
10	13 48 12.55	2.2104	7 24 9.8	10.162
11	13 50 25.19	2.2108	7 34 18.1	10.116
12	13 52 37.85	2.2113	7 44 23.7	10.069
13	13 54 50.54	2.2118	7 54 26.4	10.020
14	13 57 3.27	2.2124	8 4 26.1	9.970
15	13 59 16.03	2.2129	8 14 22.8	9.919
16	14 1 28.82	2.2134	8 24 16.4	9.868
17	14 3 41.64	2.2139	8 34 6.9	9.816
18	14 5 54.49	2.2145	8 43 54.3	9.762
19	14 8 7.38	2.2151	8 53 38.4	9.707
20	14 10 20.30	2.2157	9 3 19.2	9.652
21	14 12 33.26	2.2163	9 12 56.7	9.597
22	14 14 46.26	2.2169	9 22 30.8	9.540
23	14 16 59.29	2.2175	S. 9 32 1.5	9.482

SUNDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 19 12.36	2.2182	S. 9 41 28.7	9.423
1	14 21 25.47	2.2188	9 50 52.3	9.363
2	14 23 38.62	2.2194	10 0 12.3	9.303
3	14 25 51.80	2.2200	10 9 28.7	9.242
4	14 28 5.02	2.2207	10 18 41.4	9.180
5	14 30 18.28	2.2213	10 27 50.3	9.117
6	14 32 31.58	2.2220	10 36 55.4	9.053
7	14 34 44.92	2.2227	10 45 56.6	8.988
8	14 36 58.30	2.2233	10 54 53.9	8.923
9	14 39 11.72	2.2240	11 3 47.3	8.857
10	14 41 25.18	2.2247	11 12 36.7	8.789
11	14 43 38.68	2.2253	11 21 22.0	8.721
12	14 45 52.22	2.2260	11 30 3.2	8.652
13	14 48 5.80	2.2267	11 38 40.3	8.582
14	14 50 19.42	2.2273	11 47 13.1	8.512
15	14 52 33.08	2.2280	11 55 41.7	8.441
16	14 54 46.78	2.2287	12 4 6.0	8.369
17	14 57 0.52	2.2293	12 12 25.9	8.297
18	14 59 14.30	2.2300	12 20 41.6	8.224
19	15 1 28.12	2.2307	12 28 52.8	8.150
20	15 3 41.98	2.2313	12 36 59.6	8.075
21	15 5 55.87	2.2319	12 45 1.8	7.998
22	15 8 9.80	2.2325	12 52 59.4	7.922
23	15 10 23.77	2.2332	13 0 52.4	7.845
24	15 12 37.78	2.2338	S. 13 8 40.8	7.767

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 12 37.78	2.2338	S. 13 8 40.8	7.767
1	15 14 51.82	2.2343	13 16 24.5	7.689
2	15 17 5.90	2.2349	13 24 3.5	7.611
3	15 19 20.01	2.2355	13 31 37.8	7.532
4	15 21 34.16	2.2361	13 39 7.3	7.451
5	15 23 48.34	2.2366	13 46 31.9	7.369
6	15 26 2.55	2.2371	13 53 51.6	7.288
7	15 28 16.79	2.2376	14 1 6.4	7.206
8	15 30 31.06	2.2381	14 8 16.3	7.123
9	15 32 45.36	2.2386	14 15 21.2	7.039
10	15 34 59.69	2.2391	14 22 21.0	6.955
11	15 37 14.05	2.2395	14 29 15.8	6.871
12	15 39 28.43	2.2399	14 36 5.5	6.786
13	15 41 42.84	2.2403	14 42 50.1	6.700
14	15 43 57.27	2.2407	14 49 29.5	6.613
15	15 46 11.73	2.2411	14 56 3.7	6.527
16	15 48 26.21	2.2414	15 2 32.7	6.440
17	15 50 40.70	2.2417	15 8 56.5	6.352
18	15 52 55.21	2.2420	15 15 15.0	6.264
19	15 55 9.74	2.2423	15 21 28.2	6.175
20	15 57 24.29	2.2426	15 27 36.0	6.086
21	15 59 38.85	2.2428	15 33 38.5	5.997
22	16 1 53.42	2.2430	15 39 35.6	5.906
23	16 4 8.01	2.2432	S. 15 45 27.2	5.815

TUESDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	16 6 22.61	2.2433	S. 15 51 13.4	5.725
1	16 8 37.21	2.2434	15 56 54.2	5.633
2	16 10 51.82	2.2436	16 2 29.4	5.541
3	16 13 6.44	2.2437	16 7 59.1	5.449
4	16 15 21.06	2.2437	16 13 23.3	5.356
5	16 17 35.68	2.2436	16 18 41.9	5.263
6	16 19 50.29	2.2435	16 23 54.9	5.170
7	16 22 4.90	2.2435	16 29 2.3	5.077
8	16 24 19.51	2.2435	16 34 4.1	4.983
9	16 26 34.12	2.2434	16 39 0.3	4.889
10	16 28 48.72	2.2432	16 43 50.8	4.794
11	16 31 3.31	2.2430	16 48 35.6	4.699
12	16 33 17.88	2.2427	16 53 14.7	4.604
13	16 35 32.44	2.2425	16 57 48.1	4.508
14	16 37 46.98	2.2423	17 2 15.7	4.412
15	16 40 1.51	2.2420	17 6 37.6	4.317
16	16 42 16.02	2.2416	17 10 53.7	4.221
17	16 44 30.50	2.2412	17 15 4.1	4.125
18	16 46 44.96	2.2407	17 19 8.7	4.028
19	16 48 59.39	2.2403	17 23 7.5	3.931
20	16 51 13.80	2.2399	17 27 0.5	3.834
21	16 53 28.18	2.2393	17 30 47.6	3.737
22	16 55 42.52	2.2387	17 34 28.9	3.639
23	16 57 56.83	2.2382	17 38 4.3	3.542
24	17 0 11.10	2.2375	S. 17 41 33.9	3.444

WEDNESDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 0 11.10	2.2375	S. 17 41 33.9	3.444
1	17 2 25.33	2.2368	17 44 57.6	3.347
2	17 4 39.52	2.2361	17 48 15.5	3.249
3	17 6 53.67	2.2354	17 51 27.5	3.151
4	17 9 7.77	2.2346	17 54 33.6	3.052
5	17 11 21.82	2.2338	17 57 33.8	2.954
6	17 13 35.83	2.2330	18 0 28.1	2.856
7	17 15 49.78	2.2321	18 3 16.5	2.758
8	17 18 3.68	2.2312	18 5 59.1	2.661
9	17 20 17.52	2.2302	18 8 35.8	2.562
10	17 22 31.30	2.2292	18 11 6.5	2.464
11	17 24 45.02	2.2281	18 13 31.4	2.366
12	17 26 58.67	2.2270	18 15 50.4	2.267
13	17 29 12.26	2.2259	18 18 3.5	2.169
14	17 31 25.78	2.2248	18 20 10.7	2.070
15	17 33 39.23	2.2236	18 22 11.9	1.971
16	17 35 52.61	2.2223	18 24 7.2	1.873
17	17 38 5.91	2.2211	18 25 56.7	1.776
18	17 40 19.14	2.2198	18 27 40.3	1.677
19	17 42 32.29	2.2184	18 29 18.0	1.579
20	17 44 45.35	2.2170	18 30 49.8	1.482
21	17 46 58.33	2.2156	18 32 15.8	1.384
22	17 49 11.22	2.2142	18 33 35.9	1.287
23	17 51 24.03	2.2127	S. 18 34 50.2	1.189

THURSDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 53 36.75	2.2112	S. 18 35 58.6	1.092
1	17 55 49.37	2.2096	18 37 1.2	0.994
2	17 58 1.90	2.2081	18 37 57.9	0.897
3	18 0 14.34	2.2065	18 38 48.8	0.800
4	18 2 26.68	2.2048	18 39 33.9	0.703
5	18 4 38.91	2.2030	18 40 13.2	0.607
6	18 6 51.04	2.2013	18 40 46.7	0.510
7	18 9 3.07	2.1996	18 41 14.4	0.413
8	18 11 14.99	2.1978	18 41 36.3	0.317
9	18 13 26.80	2.1959	18 41 52.5	0.222
10	18 15 38.50	2.1941	18 42 3.0	0.127
11	18 17 50.09	2.1922	18 42 7.7	− 0.031
12	18 20 1.57	2.1903	18 42 6.7	+ 0.064
13	18 22 [illegible]	2.1883	18 42 0.0	0.159
14	18 24 24.17	2.1863	18 41 47.6	0.253
15	18 26 35.29	2.1843	18 41 29.6	0.348
16	18 28 46.29	2.1823	18 41 5.9	0.442
17	18 30 57.17	2.1802	18 40 36.6	0.535
18	18 33 7.92	2.1781	18 40 1.7	0.628
19	18 35 18.54	2.1760	18 39 21.2	0.722
20	18 37 29.04	2.1739	18 38 35.1	0.815
21	18 39 39.41	2.1717	18 37 43.4	0.907
22	18 41 49.65	2.1695	18 36 46.2	0.999
23	18 43 59.75	2.1672	18 35 43.5	1.091
24	18 46 9.72	2.1650	S. 18 34 35.2	1.183

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 46 9.72	2.1650	S. 18 34 35.2	1.183
1	18 48 19.55	2.1627	18 33 21.5	1.273
2	18 50 29.25	2.1605	18 32 2.4	1.364
3	18 52 38.81	2.1582	18 30 37.8	1.455
4	18 54 48.23	2.1558	18 29 7.8	1.545
5	18 56 57.50	2.1534	18 27 32.4	1.635
6	18 59 6.63	2.1510	18 25 51.6	1.724
7	19 1 15.62	2.1486	18 24 5.5	1.813
8	19 3 24.46	2.1461	18 22 14.1	1.902
9	19 5 33.15	2.1437	18 20 17.3	1.991
10	19 7 41.70	2.1412	18 18 15.2	2.078
11	19 9 50.10	2.1387	18 16 7.9	2.165
12	19 11 58.35	2.1362	18 13 55.4	2.252
13	19 14 6.45	2.1337	18 11 37.7	2.338
14	19 16 14.40	2.1312	18 9 14.8	2.425
15	19 18 22.19	2.1286	18 6 46.7	2.511
16	19 20 29.83	2.1261	18 4 13.5	2.596
17	19 22 37.32	2.1236	18 1 35.2	2.681
18	19 24 44.66	2.1210	17 58 51.8	2.765
19	19 26 51.84	2.1183	17 56 3.4	2.849
20	19 28 58.86	2.1157	17 53 9.9	2.933
21	19 31 5.73	2.1132	17 50 11.4	3.016
22	19 33 12.44	2.1105	17 47 8.0	3.098
23	19 35 18.99	2.1078	S. 17 43 59.6	3.181

SATURDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 37 25.38	2.1052	S. 17 40 46.3	3.263
1	19 39 31.61	2.1025	17 37 28.1	3.344
2	19 41 37.68	2.0999	17 34 5.0	3.425
3	19 43 43.60	2.0973	17 30 37.1	3.505
4	19 45 49.36	2.0946	17 27 4.4	3.585
5	19 47 54.95	2.0919	17 23 26.9	3.664
6	19 50 0.38	2.0892	17 19 44.7	3.743
7	19 52 5.65	2.0865	17 15 57.7	3.822
8	19 54 10.76	2.0838	17 12 6.0	3.900
9	19 56 15.71	2.0812	17 8 9.7	3.978
10	19 58 20.50	2.0785	17 4 8.7	4.055
11	20 0 25.13	2.0758	17 0 3.1	4.131
12	20 2 29.60	2.0732	16 55 53.0	4.207
13	20 4 33.91	2.0705	16 51 38.3	4.282
14	20 6 38.06	2.0678	16 47 19.1	4.357
15	20 8 42.05	2.0651	16 42 55.4	4.432
16	20 10 45.87	2.0624	16 38 27.2	4.507
17	20 12 49.53	2.0597	16 33 54.6	4.580
18	20 14 53.03	2.0570	16 29 17.6	4.653
19	20 16 56.37	2.0544	16 24 36.2	4.726
20	20 18 59.56	2.0518	16 19 50.5	4.798
21	20 21 2.59	2.0492	16 15 0.5	4.869
22	20 23 5.46	2.0465	16 10 6.2	4.940
23	20 25 8.17	2.0438	16 5 7.7	5.011
24	20 27 10.72	2.0412	S. 16 0 4.9	5.081

SUNDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 27 10.72	2.0412	S. 16 0 4.9	5.081
1	20 29 13.12	2.0386	15 54 58.0	5.150
2	20 31 15.36	2.0360	15 49 46.9	5.220
3	20 33 17.44	2.0334	15 44 31.6	5.289
4	20 35 19.37	2.0309	15 39 12.2	5.357
5	20 37 21.15	2.0283	15 33 48.8	5.424
6	20 39 22.77	2.0257	15 28 21.3	5.492
7	20 41 24.24	2.0232	15 22 49.8	5.558
8	20 43 25.56	2.0207	15 17 14.3	5.624
9	20 45 26.73	2.0182	15 11 34.9	5.689
10	20 47 27.75	2.0157	15 5 51.6	5.754
11	20 49 28.62	2.0132	15 0 4.4	5.819
12	20 51 29.34	2.0108	14 54 13.3	5.883
13	20 53 29.92	2.0084	14 48 18.4	5.947
14	20 55 30.35	2.0059	14 42 19.7	6.010
15	20 57 30.63	2.0035	14 36 17.2	6.072
16	20 59 30.77	2.0012	14 30 11.0	6.134
17	21 1 30.77	1.9988	14 24 1.1	6.196
18	21 3 30.63	1.9965	14 17 47.5	6.257
19	21 5 30.35	1.9942	14 11 30.3	6.318
20	21 7 29.93	1.9918	14 5 9.4	6.378
21	21 9 29.37	1.9896	13 58 44.9	6.437
22	21 11 28.68	1.9874	13 52 16.9	6.496
23	21 13 27.86	1.9852	S. 13 45 45.4	6.555

MONDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	21 15 26.90	1.9829	S. 13 39 10.3	6.614
1	21 17 25.81	1.9807	13 32 31.7	6.671
2	21 19 24.59	1.9786	13 25 49.8	6.727
3	21 21 23.24	1.9765	13 19 4.5	6.783
4	21 23 21.77	1.9744	13 12 15.8	6.840
5	21 25 20.17	1.9723	13 5 23.7	6.896
6	21 27 18.45	1.9702	12 58 28.3	6.951
7	21 29 16.60	1.9682	12 51 29.6	7.005
8	21 31 14.64	1.9663	12 44 27.7	7.059
9	21 33 12.56	1.9644	12 37 22.5	7.113
10	21 35 10.37	1.9625	12 30 14.1	7.166
11	21 37 8.06	1.9605	12 23 2.6	7.218
12	21 39 5.63	1.9586	12 15 47.9	7.271
13	21 41 3.09	1.9568	12 8 30 1	7.323
14	21 43 0.45	1.9551	12 1 9.2	7.373
15	21 44 57.70	1.9533	11 53 45.3	7.423
16	21 46 54.84	1.9515	11 46 18.4	7.473
17	21 48 51.88	1.9498	11 38 48.5	7.524
18	21 50 48.82	1.9482	11 31 15.5	7.574
19	21 52 45.66	1.9465	11 23 39.6	7.623
20	21 54 42.40	1.9449	11 16 0.9	7.669
21	21 56 39.05	1.9434	11 8 19.3	7.717
22	21 58 35.61	1.9419	11 0 34.8	7.765
23	22 0 32.08	1.9403	10 52 47.5	7.812
24	22 2 28.45	1.9388	S. 10 44 57.4	7.858

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
			TUESDAY 25.					THURSDAY 27.	
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 2 28.45	1.9388	S. 10 44 57.4	7.858	0	23 34 36.73	1.9169	S. 3 43 43.8	9.505
1	22 4 24.74	1.9374	10 37 4.6	7.903	1	23 36 31.76	1.9175	3 34 12.8	9.527
2	22 6 20.94	1.9360	10 29 9.0	7.949	2	23 38 26.83	1.9182	3 24 40.5	9.548
3	22 8 17.06	1.9347	10 21 10.7	7.994	3	23 40 21.95	1.9190	3 15 7.0	9.569
4	22 10 13.10	1.9333	10 13 9.7	8.038	4	23 42 17.11	1.9198	3 5 32.2	9.590
5	22 12 9.06	1.9321	10 5 6.1	8.082	5	23 44 12.33	1.9207	2 55 56.2	9.609
6	22 14 4.95	1.9309	9 56 59.9	8.125	6	23 46 7.60	1.9217	2 46 19.1	9.628
7	22 16 0.77	1.9296	9 48 51.1	8.167	7	23 48 2.93	1.9226	2 36 40.8	9.647
8	22 17 56.51	1.9284	9 40 39.8	8.210	8	23 49 58.31	1.9235	2 27 1.4	9.666
9	22 19 52.18	1.9273	9 32 25.9	8.252	9	23 51 53.75	1.9246	2 17 20.9	9.684
10	22 21 47.79	1.9263	9 24 9.5	8.293	10	23 53 49.26	1.9257	2 7 39.3	9.701
11	22 23 43.34	1.9252	9 15 50.7	8.334	11	23 55 44.83	1.9268	1 57 56.8	9.717
12	22 25 38.82	1.9242	9 7 29.4	8.375	12	23 57 40.47	1.9280	1 48 13.3	9.733
13	22 27 34.24	1.9233	8 59 5.7	8.415	13	23 59 36.19	1.9292	1 38 28.8	9.749
14	22 29 29.61	1.9224	8 50 39.6	8.454	14	0 1 31.98	1.9305	1 28 43.4	9.763
15	22 31 24.93	1.9215	8 42 11.2	8.493	15	0 3 27.85	1.9318	1 18 57.2	9.777
16	22 33 20.19	1.9206	8 33 40.4	8.531	16	0 5 23.80	1.9332	1 9 10.1	9.791
17	22 35 15.40	1.9197	8 25 7.4	8.569	17	0 7 19.84	1.9347	0 59 22.2	9.804
18	22 37 10.56	1.9190	8 16 32.1	8.607	18	0 9 15.97	1.9362	0 49 33.6	9.817
19	22 39 5.68	1.9183	8 7 54.5	8.645	19	0 11 12.18	1.9377	0 39 44.2	9.829
20	22 41 0.76	1.9176	7 59 14.7	8.681	20	0 13 8.49	1.9393	0 29 54.1	9.840
21	22 42 55.79	1.9169	7 50 32.8	8.717	21	0 15 4.90	1.9410	0 20 3.4	9.851
22	22 44 50.79	1.9164	7 41 48.7	8.752	22	0 17 1.41	1.9427	0 10 12.0	9.862
23	22 46 45.76	1.9159	S. 7 33 2.5	8.787	23	0 18 58.02	1.9444	S. 0 0 20.0	9.871
			WEDNESDAY 26.					FRIDAY 28.	
0	22 48 40.70	1.9154	S. 7 24 14.2	8.822	0	0 20 54.74	1.9462	N. 0 9 32.5	9.879
1	22 50 35.61	1.9149	7 15 23.8	8.857	1	0 22 51.57	1.9481	0 19 25.5	9.888
2	22 52 30.49	1.9145	7 6 31.4	8.890	2	0 24 48.51	1.9499	0 29 19.0	9.896
3	22 54 25.35	1.9142	6 57 37.0	8.923	3	0 26 45.56	1.9518	0 39 13.0	9.903
4	22 56 20.19	1.9138	6 48 40.6	8.956	4	0 28 42.73	1.9538	0 49 7.4	9.909
5	22 58 15.01	1.9135	6 39 42.3	8.989	5	0 30 40.02	1.9559	0 59 2.1	9.914
6	23 0 9.81	1.9133	6 30 42.0	9.021	6	0 32 37.44	1.9580	1 8 57.1	9.919
7	23 2 4.60	1.9131	6 21 39.8	9.052	7	0 34 34.98	1.9601	1 18 52.4	9.924
8	23 3 59.38	1.9129	6 12 35.8	9.082	8	0 36 32.65	1.9623	1 28 48.0	9.928
9	23 5 54.15	1.9128	6 3 30.0	9.112	9	0 38 30.46	1.9646	1 38 43.8	9.932
10	23 7 48.92	1.9128	5 54 22.4	9.142	10	0 40 28.41	1.9669	1 48 39.8	9.934
11	23 9 43.69	1.9128	5 45 13.0	9.171	11	0 42 26.49	1.9692	1 58 35.9	9.936
12	23 11 38.45	1.9128	5 36 1.9	9.199	12	0 44 24.71	1.9716	2 8 32.1	9.937
13	23 13 33.22	1.9129	5 26 49.1	9.228	13	0 46 23.08	1.9741	2 18 28.4	9.937
14	23 15 28.00	1.9130	5 17 34.6	9.256	14	0 48 21.60	1.9765	2 28 24.6	9.937
15	23 17 22.78	1.9132	5 8 18.4	9.283	15	0 50 20.26	1.9790	2 38 20.8	9.936
16	23 19 17.58	1.9134	4 59 0.6	9.310	16	0 52 19.08	1.9816	2 48 16.9	9.934
17	23 21 12.39	1.9137	4 49 41.2	9.336	17	0 54 18.06	1.9843	2 58 12.9	9.932
18	23 23 7.22	1.9140	4 40 20.3	9.361	18	0 56 17.20	1.9870	3 8 8.8	9.929
19	23 25 2.07	1.9143	4 30 57.9	9.386	19	0 58 16.50	1.9898	3 18 4.4	9.925
20	23 26 56.94	1.9147	4 21 34.0	9.412	20	1 0 15.97	1.9926	3 27 59.8	9.921
21	23 28 51.84	1.9152	4 12 8.5	9.436	21	1 2 15.61	1.9954	3 37 54.9	9.915
22	23 30 46.77	1.9157	4 2 41.6	9.459	22	1 4 15.42	1.9983	3 47 49.6	9.909
23	23 32 41.73	1.9163	3 53 13.4	9.482	23	1 6 15.41	2.0012	3 57 44.0	9.903
24	23 34 36.73	1.9169	S. 3 43 43.8	9.505	24	1 8 15.57	2.0042	N. 4 7 38.0	9.896

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 8 15.57	2.0042	N. 4 7 38.0	9.896
1	1 10 15.91	2.0072	4 17 31.5	9.887
2	1 12 16.44	2.0103	4 27 24.5	9.878
3	1 14 17.15	2.0134	4 37 16.9	9.868
4	1 16 18.05	2.0166	4 47 8.7	9.857
5	1 18 19.14	2.0198	4 56 59.8	9.846
6	1 20 20.43	2.0231	5 6 50.2	9.834
7	1 22 21.91	2.0264	5 16 39.9	9.822
8	1 24 23.59	2.0298	5 26 28.8	9.808
9	1 26 25.48	2.0332	5 36 16.8	9.793
10	1 28 27.57	2.0366	5 46 3.9	9.778
11	1 30 29.87	2.0401	5 55 50.1	9.762
12	1 32 32.38	2.0436	6 5 35.3	9.745
13	1 34 35.10	2.0472	6 15 19.5	9.727
14	1 36 38.04	2.0508	6 25 2.5	9.708
15	1 38 41.20	2.0545	6 34 44.4	9.688
16	1 40 44.58	2.0582	6 44 25.1	9.667
17	1 42 48.18	2.0618	6 54 4.5	9.646
18	1 44 52.00	2.0656	7 3 42.6	9.624
19	1 46 56.05	2.0695	7 13 19.3	9.601
20	1 49 0.34	2.0734	7 22 54.7	9.577
21	1 51 4.86	2.0773	7 32 28.6	9.552
22	1 53 9.62	2.0813	7 42 1.0	9.527
23	1 55 14.62	2.0852	N. 7 51 31.8	9.500

SUNDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 57 19.85	2.0892	N. 8 1 1.0	9.472
1	1 59 25.33	2.0933	8 10 28.5	9.444
2	2 1 31.05	2.0974	8 19 54.3	9.414
3	2 3 37.02	2.1016	8 29 18.2	9.383
4	2 5 43.24	2.1058	8 38 40.3	9.352
5	2 7 49.71	2.1100	8 48 0.5	9.320
6	2 9 56.44	2.1142	8 57 18.7	9.287
7	2 12 3.42	2.1185	9 6 34.9	9.252
8	2 14 10.66	2.1229	9 15 49.0	9.217
9	2 16 18.17	2.1273	9 25 1.0	9.182
10	2 18 25.94	2.1317	9 34 10.8	9.144
11	2 20 33.97	2.1361	9 43 18.3	9.106
12	2 22 42.27	2.1406	9 52 23.5	9.067
13	2 24 50.84	2.1451	10 1 26.3	9.027
14	2 26 59.68	2.1495	10 10 26.7	8.986
15	2 29 8.78	2.1540	10 19 24.6	8.943
16	2 31 18.16	2.1586	10 28 19.9	8.900
17	2 33 27.81	2.1632	10 37 12.6	8.856
18	2 35 37.74	2.1678	10 46 2.6	8.810
19	2 37 47.95	2.1725	10 54 49.8	8.763
20	2 39 58.44	2.1771	11 3 34.2	8.717
21	2 42 9.20	2.1818	11 12 15.8	8.668
22	2 44 20.25	2.1865	11 20 54.4	8.618
23	2 46 31.58	2.1912	11 29 30.0	8.568
24	2 48 43.20	2.1960	N.11 38 2.6	8.517

MONDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 48 43.20	2.1960	N.11 38 2.6	8.517
1	2 50 55.10	2.2008	11 46 32.1	8.464
2	2 53 7.29	2.2056	11 54 58.3	8.409
3	2 55 19.77	2.2104	12 3 21.2	8.354
4	2 57 32.54	2.2152	12 11 40.8	8.299
5	2 59 45.60	2.2200	12 19 57.1	8.242
6	3 1 58.94	2.2248	12 28 9.9	8.184
7	3 4 12.58	2.2297	12 36 19.2	8.125
8	3 6 26.51	2.2347	12 44 24.9	8.064
9	3 8 40.74	2.2396	12 52 26.9	8.003
10	3 10 55.26	2.2444	13 0 25.2	7.941
11	3 13 10.07	2.2493	13 8 19.8	7.877
12	3 15 25.17	2.2542	13 16 10.5	7.812
13	3 17 40.57	2.2592	13 23 57.3	7.747
14	3 19 56.27	2.2641	13 31 40.1	7.680
15	3 22 12.26	2.2690	13 39 18.9	7.612
16	3 24 28.55	2.2739	13 46 53.6	7.542
17	3 26 45.13	2.2788	13 54 24.0	7.472
18	3 29 2.00	2.2837	14 1 50.2	7.401
19	3 31 19.17	2.2886	14 9 12.1	7.329
20	3 33 36.63	2.2935	14 16 29.7	7.256
21	3 35 54.39	2.2984	14 23 42.8	7.181
22	3 38 12.44	2.3033	14 30 51.4	7.105
23	3 40 30.79	2.3082	N.14 37 55.4	7.027

TUESDAY, JUNE 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	3 42 49.43	2.3131	N.14 44 54.7	6.949

PHASES OF THE MOON.

		d	h	m
● New Moon . .	May	3	15	42.5
☽ First Quarter . . .		10	14	20.6
○ Full Moon		17	13	47.1
☾ Last Quarter. . . .		25	11	36.1

		d	h
☾ Perigee. . . .	May	10	12.5
☾ Apogee.		24	11.3

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	α Aquilæ	W.	72° 59′ 46″	3306	74° 23′ 50″	3288	75° 48′ 16″	3269	77° 13′ 4″	3251
	Fomalhaut	W.	40 46 4	3667	42 3 26	3604	43 21 56	3545	44 41 30	3492
	Sun	E.	31 46 15	3210	30 20 18	3201	28 54 10	3193	27 27 53	3186
5	Sun	W.	17 33 41	2905	19 5 54	2875	20 38 45	2851	22 12 7	2830
	Pollux	E.	51 8 11	2583	49 28 53	2581	47 49 32	2580	46 10 10	2580
	Regulus	E.	86 32 57	2455	84 50 41	2446	83 8 12	2438	81 25 31	2430
	Mars	E.	96 14 12	2520	94 33 27	2512	92 52 30	2504	91 11 22	2496
6	Sun	W.	30 4 47	2755	31 40 14	2744	33 15 55	2734	34 51 50	2724
	Pollux	E.	37 54 8	2607	36 15 22	2619	34 36 53	2635	32 58 45	2653
	Regulus	E.	72 49 23	2393	71 5 38	2387	69 21 44	2381	67 37 42	2375
	Mars	E.	82 43 2	2460	81 0 53	2454	79 18 35	2448	77 36 9	2442
	Jupiter	E.	101 0 53	2375	99 16 43	2369	97 32 24	2363	95 47 56	2357
7	Sun	W.	42 54 22	2685	44 31 22	2678	46 8 31	2672	47 45 48	2666
	Regulus	E.	58 55 29	2348	57 10 40	2344	55 25 45	2340	53 40 44	2336
	Mars	E.	69 2 1	2417	67 18 51	2413	65 35 35	2408	63 52 12	2405
	Jupiter	E.	87 3 34	2331	85 18 20	2326	83 32 59	2322	81 47 32	2318
8	Sun	W.	55 53 58	2643	57 31 54	2640	59 9 55	2636	60 48 1	2633
	Regulus	E.	44 54 17	2320	43 8 46	2317	41 23 11	2315	39 37 33	2312
	Mars	E.	55 14 6	2389	53 30 16	2387	51 46 22	2384	50 2 25	2383
	Jupiter	E.	72 58 56	2302	71 12 59	2298	69 26 57	2296	67 40 51	2294
	Spica	E.	98 30 1	2333	96 44 50	2330	94 59 34	2327	93 14 14	2325
9	Sun	W.	68 59 29	2620	70 37 57	2618	72 16 27	2617	73 54 59	2615
	Saturn	W.	22 38 16	2403	24 21 46	2393	26 5 31	2384	27 49 29	2376
	Mars	E.	41 22 5	2375	39 37 55	2375	37 53 45	2375	36 9 34	2374
	Jupiter	E.	58 49 37	2285	57 3 15	2283	55 16 50	2281	53 30 23	2260
	Spica	E.	84 26 45	2315	82 41 7	2313	80 55 27	2312	79 9 45	2311
10	Sun	W.	82 8 6	2610	83 46 47	2610	85 25 29	2610	87 4 11	2610
	Saturn	W.	36 31 32	2353	38 16 14	2350	40 1 0	2348	41 45 50	2345
	Pollux	W.	22 14 17	2842	23 47 50	2769	25 22 58	2710	26 59 25	2661
	Jupiter	E.	44 37 49	2277	42 51 16	2276	41 4 42	2276	39 18 8	2277
	Spica	E.	70 21 0	2309	68 35 13	2309	66 49 27	2310	65 3 42	2310
11	Sun	W.	95 17 39	2611	96 56 19	2612	98 34 57	2613	100 13 34	2614
	Saturn	W.	50 30 34	2341	52 15 34	2341	54 0 34	2341	55 45 34	2342
	Pollux	W.	35 14 48	2516	36 55 39	2499	38 36 54	2484	40 18 30	2471
	Jupiter	E.	30 25 25	2279	28 38 54	2280	26 52 25	2281	25 5 57	2282
	Spica	E.	56 15 10	2316	54 29 34	2317	52 44 0	2320	50 58 29	2322
	Antares	E.	102 1 52	2353	100 17 9	2353	98 32 27	2353	96 47 45	2354
12	Sun	W.	108 26 11	2623	110 4 35	2625	111 42 56	2628	113 21 13	2631
	Saturn	W.	64 30 22	2346	66 15 15	2347	68 0 6	2348	69 44 55	2350
	Pollux	W.	48 50 12	2431	50 33 3	2426	52 16 0	2422	53 59 3	2419
	Spica	E.	42 11 59	2340	40 26 58	2344	38 42 3	2350	36 57 16	2356
	Antares	E.	88 4 33	2360	86 20 1	2362	84 35 32	2364	82 51 6	2367
13	Sun	W.	121 31 35	2648	123 9 25	2652	124 47 9	2657	126 24 47	2662

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}.	P. L. of Diff.	XVIII^{h}.	P. L. of Diff.	XXI^{h}.	P. L. of Diff.
1	α Aquilæ	W.	78° 38′ 13″	3233	80° 3′ 43″	3216	81° 29′ 33″	3201	82° 55′ 41″	3186
	Fomalhaut	W.	46 2 2	3443	47 23 31	3397	48 45 51	3353	50 9 1	3313
	Sun	E.	26 1 27	3179	24 34 53	3174	23 8 13	3172	21 41 30	3171
5	Sun	W.	23 45 56	2811	25 20 9	2795	26 54 43	2781	28 29 36	2767
	Pollux	E.	44 30 48	2583	42 51 29	2585	41 12 14	2591	39 33 6	2598
	Regulus	E.	79 42 39	2422	77 59 36	2415	76 16 22	2408	74 32 58	2400
	Mars	E.	89 30 3	2488	87 48 33	2481	86 6 53	2473	84 25 2	2467
6	Sun	W.	36 27 58	2715	38 4 18	2707	39 40 49	2698	41 17 31	2692
	Pollux	E.	31 21 2	2677	29 43 51	2707	28 7 20	2743	26 31 37	2788
	Regulus	E.	65 53 32	2369	64 9 13	2364	62 24 46	2358	60 40 11	2353
	Mars	E.	75 53 34	2437	74 10 52	2431	72 28 2	2426	70 45 5	2421
	Jupiter	E.	94 3 19	2351	92 18 34	2346	90 33 41	2341	88 48 41	2336
7	Sun	W.	49 23 13	2661	51 0 45	2657	52 38 23	2652	54 16 8	2648
	Regulus	E.	51 55 37	2333	50 10 25	2328	48 25 7	2325	46 39 44	2322
	Mars	E.	62 8 44	2401	60 25 11	2398	58 41 34	2395	56 57 52	2392
	Jupiter	E.	80 1 59	2314	78 16 20	2311	76 30 36	2308	74 44 48	2305
8	Sun	W.	62 26 11	2630	64 4 25	2627	65 42 43	2625	67 21 4	2622
	Regulus	E.	37 51 51	2310	36 6 6	2309	34 20 19	2308	32 34 31	2307
	Mars	E.	48 18 26	2381	46 34 24	2380	44 50 20	2378	43 6 14	2376
	Jupiter	E.	65 54 42	2291	64 8 30	2289	62 22 15	2287	60 35 57	2286
	Spica	E.	91 28 51	2322	89 43 24	2320	87 57 54	2318	86 12 21	2316
9	Sun	W.	75 33 33	2614	77 12 9	2612	78 50 47	2612	80 29 26	2611
	Saturn	W.	29 33 38	2370	31 17 56	2364	33 2 22	2360	34 46 54	2356
	Mars	E.	34 25 22	2374	32 41 10	2375	30 56 59	2375	29 12 48	2375
	Jupiter	E.	51 43 54	2279	49 57 24	2279	48 10 53	2278	46 24 21	2278
	Spica	E.	77 24 2	2311	75 38 18	2310	73 52 33	2309	72 6 47	2309
10	Sun	W.	88 42 53	2610	90 21 35	2610	92 0 17	2610	93 38 58	2610
	Saturn	W.	43 30 44	2344	45 15 40	2343	47 0 37	2342	48 45 35	2342
	Pollux	W.	28 36 57	2621	30 15 23	2588	31 54 35	2560	33 34 25	2536
	Jupiter	E.	37 31 35	2277	35 45 2	2277	33 58 29	2278	32 11 57	2278
	Spica	E.	63 17 57	2311	61 32 13	2311	59 46 30	2313	58 0 49	2314
11	Sun	W.	101 52 10	2615	103 30 44	2617	105 9 16	2619	106 47 45	2621
	Saturn	W.	57 30 33	2342	59 15 32	2342	61 0 30	2343	62 45 27	2344
	Pollux	W.	42 0 24	2460	43 42 33	2451	45 24 55	2443	47 7 29	2436
	Jupiter	E.	23 19 31	2283	21 33 7	2285	19 46 45	2286	18 0 25	2287
	Spica	E.	49 13 2	2325	47 27 39	2328	45 42 20	2332	43 57 7	2335
	Antares	E.	95 3 4	2355	93 18 24	2355	91 33 45	2357	89 49 8	2358
12	Sun	W.	114 59 26	2634	116 37 35	2637	118 15 40	2640	119 53 40	2644
	Saturn	W.	71 29 41	2353	73 14 24	2355	74 59 4	2357	76 43 40	2360
	Pollux	W.	55 42 11	2417	57 25 22	2415	59 8 36	2413	60 51 52	2413
	Spica	E.	35 12 38	2363	33 28 10	2371	31 43 54	2380	29 59 51	2391
	Antares	E.	81 6 44	2370	79 22 26	2373	77 38 12	2377	75 54 4	2380
13	Sun	W.	128 2 18	2667	129 39 42	2672	131 16 59	2678	132 54 8	2684

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
13	Saturn	W.	78° 28′ 12″	2363	80° 12′ 40″	2366	81° 57′ 4″	2369	83° 41′ 23″	2373
	Pollux	W.	62 35 8	2413	64 18 24	2413	66 1 40	2414	67 44 55	2415
	Regulus	W.	25 53 41	2328	27 38 59	2331	29 24 14	2333	31 9 26	2336
	Antares	E.	74 10 1	2384	72 26 4	2389	70 42 14	2394	68 58 30	2399
14	Saturn	W.	92 21 33	2394	94 5 16	2399	95 48 52	2405	97 32 20	2410
	Pollux	W.	76 20 28	2429	78 3 22	2432	79 46 11	2436	81 28 54	2441
	Regulus	W.	39 54 14	2354	41 38 55	2358	43 23 30	2363	45 7 58	2368
	Mars	W.	28 6 4	2446	29 48 33	2450	31 30 56	2455	33 13 13	2460
	Antares	E.	60 21 56	2431	58 39 6	2440	56 56 28	2448	55 14 2	2458
15	Regulus	W.	53 48 19	2398	55 31 57	2404	57 15 26	2411	58 58 45	2419
	Mars	W.	41 42 45	2489	43 24 14	2496	45 5 33	2503	46 46 42	2510
	Jupiter	W.	25 55 5	2387	27 38 58	2394	29 22 41	2401	31 6 14	2409
	Antares	E.	46 45 24	2514	45 4 30	2528	43 23 56	2544	41 43 44	2561
	α Aquilæ	E.	95 33 3	2853	93 59 44	2858	92 26 31	2863	90 53 25	2869
16	Regulus	W.	67 32 40	2458	69 14 53	2466	70 56 54	2475	72 38 42	2485
	Mars	W.	55 9 45	2551	56 49 47	2561	58 29 36	2570	60 9 12	2580
	Jupiter	W.	39 41 14	2449	41 23 39	2458	43 5 52	2467	44 47 52	2476
	α Aquilæ	E.	83 10 33	2920	81 38 39	2932	80 7 1	2946	78 35 40	2962
17	Regulus	W.	81 4 25	2533	82 44 52	2543	84 25 5	2554	86 5 3	2565
	Mars	W.	68 23 52	2631	70 2 5	2641	71 40 4	2652	73 17 48	2663
	Jupiter	W.	53 14 31	2525	54 55 9	2536	56 35 32	2547	58 15 40	2558
	Spica	W.	27 51 7	2610	29 29 48	2612	31 8 26	2616	32 46 59	2621
	α Aquilæ	E.	71 4 8	3053	69 35 1	3074	68 6 20	3098	66 38 8	3123
18	Regulus	W.	94 21 7	2621	95 59 33	2633	97 37 43	2644	99 15 38	2656
	Mars	W.	81 22 37	2722	82 58 47	2735	84 34 41	2747	86 10 19	2759
	Jupiter	W.	66 32 32	2615	68 11 7	2626	69 49 27	2638	71 27 31	2650
	Spica	W.	40 57 33	2660	42 35 7	2669	44 12 29	2678	45 49 38	2669
	α Aquilæ	E.	59 25 14	3271	58 0 29	3307	56 36 26	3345	55 13 7	3386
19	Jupiter	W.	79 33 44	2710	81 10 10	2722	82 46 20	2735	84 22 13	2747
	Spica	W.	53 51 56	2741	55 27 41	2753	57 3 11	2764	58 38 26	2775
	α Aquilæ	E.	48 29 2	3635	47 11 5	3696	45 54 14	3763	44 38 33	3835
	Fomalhaut	E.	79 21 25	3057	77 52 23	3073	76 23 40	3089	74 55 17	3106
	α Pegasi	E.	94 8 18	2989	92 37 51	3000	91 7 38	3012	89 37 40	3024
20	Jupiter	W.	92 17 39	2808	93 51 57	2820	95 25 59	2831	96 59 46	2842
	Spica	W.	66 31 1	2832	68 4 47	2843	69 38 19	2855	71 11 36	2866
	Antares	W.	22 21 1	3243	23 46 19	3204	25 12 24	3173	26 39 6	3149
	Fomalhaut	E.	67 38 53	3203	66 12 47	3225	64 47 7	3247	63 21 53	3269
	α Pegasi	E.	82 11 45	3091	80 43 24	3105	79 15 20	3119	77 47 34	3135
21	Spica	W.	78 54 32	2920	80 26 26	2930	81 58 7	2939	83 29 36	2949
	Antares	W.	33 57 46	3095	35 26 2	3091	36 54 23	3088	38 22 47	3087
	Fomalhaut	E.	56 22 41	3398	55 0 22	3428	53 38 37	3458	52 17 26	3491
	α Pegasi	E.	70 33 24	3214	69 7 32	3231	67 42 0	3248	66 16 48	3265
	Venus	E.	94 41 22	3297	93 17 7	3309	91 53 6	3320	90 29 18	3331
	Sun	E.	139 8 41	3291	137 44 19	3300	136 20 8	3309	134 56 7	3319

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
13	Saturn	W.	85° 25′ 36″	2377	87° 9′ 44″	2380	88° 53′ 47″	2385	90° 37′ 43″	2389
	Pollux	W.	69 28 8	2417	71 11 18	2419	72 54 25	2422	74 37 29	2425
	Regulus	W.	32 54 33	2339	34 39 36	2342	36 24 34	2346	38 9 27	2350
	Antares	E.	67 14 54	2405	65 31 26	2410	63 48 6	2417	62 4 56	2424
14	Saturn	W.	99 15 41	2415	100 58 54	2421	102 41 58	2428	104 24 53	2434
	Pollux	W.	83 11 30	2446	84 53 59	2451	86 36 21	2458	88 18 34	2463
	Regulus	W.	46 52 18	2373	48 36 31	2379	50 20 36	2385	52 4 32	2391
	Mars	W.	34 55 23	2465	36 37 26	2470	38 19 21	2477	40 1 7	2482
	Antares	E.	53 31 49	2467	51 49 50	2477	50 8 5	2489	48 26 36	2501
15	Regulus	W.	60 41 53	2426	62 24 51	2433	64 7 39	2441	65 50 15	2449
	Mars	W.	48 27 41	2518	50 8 29	2526	51 49 6	2535	53 29 31	2543
	Jupiter	W.	32 49 36	2416	34 32 48	2424	36 15 48	2432	37 58 37	2441
	Antares	E.	40 3 55	2579	38 24 31	2599	36 45 34	2620	35 7 6	2644
	α Aquilæ	E.	89 20 27	2878	87 47 40	2887	86 15 5	2897	84 42 42	2908
16	Regulus	W.	74 20 17	2494	76 1 39	2503	77 42 48	2513	79 23 43	2522
	Mars	W.	61 48 35	2589	63 27 45	2599	65 6 41	2609	66 45 24	2620
	Jupiter	W.	46 29 39	2485	48 11 13	2495	49 52 33	2505	51 33 39	2515
	α Aquilæ	E.	77 4 39	2977	75 33 58	2994	74 3 38	3013	72 33 41	3032
17	Regulus	W.	87 44 46	2576	89 24 14	2587	91 3 27	2598	92 42 25	2610
	Mars	W.	74 55 17	2675	76 32 31	2687	78 9 29	2698	79 46 11	2710
	Jupiter	W.	59 55 33	2569	61 35 11	2580	63 14 34	2591	64 53 41	2603
	Spica	W.	34 25 25	2628	36 3 42	2635	37 41 50	2643	39 19 47	2651
	α Aquilæ	E.	65 10 26	3149	63 43 16	3177	62 16 39	3207	60 50 38	3238
18	Regulus	W.	100 53 17	2668	102 30 40	2681	104 7 46	2692	105 44 36	2704
	Mars	W.	87 45 41	2771	89 20 47	2784	90 55 36	2797	92 30 8	2810
	Jupiter	W.	73 5 18	2662	74 42 49	2674	76 20 4	2687	77 57 2	2698
	Spica	W.	47 26 33	2698	49 3 15	2709	50 39 43	2719	52 15 57	2731
	α Aquilæ	E.	53 50 34	3429	52 28 50	3475	51 7 58	3525	49 48 1	3577
19	Jupiter	W.	85 57 50	2760	87 33 11	2772	89 8 16	2784	90 43 5	2795
	Spica	W.	60 13 27	2786	61 48 13	2798	63 22 44	2809	64 57 0	2821
	α Aquilæ	E.	43 24 7	3914	42 11 1	4000	40 59 21	4092	39 49 12	4196
	Fomalhaut	E.	73 27 15	3124	71 59 35	3143	70 32 18	3163	69 5 24	3182
	α Pegasi	E.	88 7 57	3036	86 38 29	3050	85 9 18	3063	83 40 23	3077
20	Jupiter	W.	98 33 19	2854	100 6 37	2866	101 39 40	2877	103 12 28	2888
	Spica	W.	72 44 39	2876	74 17 28	2887	75 50 3	2898	77 22 24	2909
	Antares	W.	28 6 16	3132	29 33 47	3118	31 1 35	3107	32 29 36	3100
	Fomalhaut	E.	61 57 5	3293	60 32 45	3318	59 8 54	3343	57 45 32	3370
	α Pegasi	E.	76 20 7	3150	74 52 58	3165	73 26 7	3182	71 59 36	3198
21	Spica	W.	85 0 53	2959	86 31 57	2969	88 2 49	2977	89 33 30	2986
	Antares	W.	39 51 12	3087	41 19 37	3089	42 48 0	3090	44 16 22	3091
	Fomalhaut	E.	50 56 52	3525	49 36 56	3562	48 17 40	3600	46 59 6	3642
	α Pegasi	E.	64 51 56	3284	63 27 26	3303	62 3 18	3322	60 39 32	3343
	Venus	E.	89 5 42	3342	87 42 19	3352	86 19 8	3363	84 56 9	3372
	Sun	E.	133 32 17	3327	132 8 37	3337	130 45 8	3346	129 21 50	3355

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
22	Antares	W.	45° 44′ 42″	3094	47° 12′ 59″	3097	48° 41′ 12″	3100	50° 9′ 22″	3102
	Fomalhaut	E.	45 41 17	3686	44 24 15	3734	43 8 4	3785	41 52 46	3841
	α Pegasi	E.	59 16 10	3363	57 53 11	3384	56 30 36	3406	55 8 26	3430
	Venus	E.	83 33 21	3382	82 10 44	3391	80 48 17	3400	79 26 0	3408
	α Arietis	E.	101 58 17	3113	100 30 23	3120	99 2 38	3127	97 35 1	3133
	Sun	E.	127 58 42	3363	126 35 43	3371	125 12 53	3379	123 50 12	3386
23	Antares	W.	57 29 18	3117	58 57 7	3120	60 24 52	3123	61 52 34	3124
	Fomalhaut	E.	35 52 12	4207	34 43 53	4305	33 37 5	4415	32 31 57	4539
	α Pegasi	E.	48 24 32	3563	47 5 17	3594	45 46 36	3628	44 28 32	3664
	Venus	E.	72 36 52	3445	71 15 26	3450	69 54 6	3456	68 32 53	3461
	α Arietis	E.	90 18 49	3163	88 51 56	3169	87 25 10	3174	85 58 30	3178
	Sun	E.	116 58 45	3418	115 36 49	3423	114 14 59	3428	112 53 14	3432
24	Antares	W.	69 10 32	3132	70 38 3	3133	72 5 33	3133	73 33 3	3132
	Venus	E.	61 48 0	3480	60 27 13	3481	59 6 28	3482	57 45 44	3483
	α Arietis	E.	78 46 30	3199	77 20 20	3204	75 54 15	3206	74 28 13	3209
	Sun	E.	106 5 35	3447	104 44 12	3449	103 22 51	3451	102 1 32	3452
25	Antares	W.	80 50 48	3126	82 18 26	3123	83 46 8	3120	85 13 53	3116
	α Aquilæ	W.	39 13 22	4418	40 18 27	4335	41 24 47	4259	42 32 18	4189
	Venus	E.	51 2 12	3481	49 41 27	3480	48 20 40	3477	46 59 50	3473
	α Arietis	E.	67 18 47	3220	65 53 1	3221	64 27 17	3223	63 1 35	3225
	Sun	E.	95 14 58	3447	93 53 35	3446	92 32 10	3443	91 10 42	3438
26	Antares	W.	92 33 50	3094	94 2 7	3089	95 30 30	3082	96 59 1	3077
	α Aquilæ	W.	48 24 53	3913	49 38 0	3869	50 51 51	3827	52 6 25	3789
	Venus	E.	40 14 35	3450	38 53 15	3444	37 31 48	3438	36 10 14	3431
	α Arietis	E.	55 53 28	3231	54 27 55	3232	53 2 24	3234	51 36 55	3236
	Sun	E.	84 22 11	3415	83 0 11	3409	81 38 5	3402	80 15 51	3395
27	α Aquilæ	W.	58 28 47	3621	59 46 59	3592	61 5 42	3564	62 24 56	3537
	α Arietis	E.	44 30 24	3257	43 5 22	3265	41 40 29	3273	40 15 46	3282
	Sun	E.	73 22 25	3351	71 59 13	3342	70 35 50	3332	69 12 15	3321
28	α Aquilæ	W.	69 8 11	3416	70 30 10	3393	71 52 35	3371	73 15 25	3350
	Fomalhaut	W.	37 6 12	3901	38 19 31	3820	39 34 12	3746	40 50 10	3679
	α Pegasi	W.	24 50 52	5172	25 45 35	4910	26 43 42	4683	27 44 56	4486
	Sun	E.	62 11 4	3262	60 46 8	3249	59 20 57	3236	57 55 30	3223
29	α Aquilæ	W.	80 15 26	3253	81 40 33	3234	83 6 2	3216	84 31 52	3199
	Fomalhaut	W.	47 26 21	3409	48 48 27	3365	50 11 23	3324	51 35 7	3284
	α Pegasi	W.	33 28 43	3813	34 43 32	3719	35 59 59	3634	37 17 57	3556
	Sun	E.	50 44 15	3153	49 17 10	3139	47 49 48	3125	46 22 9	3110
30	Fomalhaut	W.	58 44 39	3114	60 12 32	3083	61 41 2	3055	63 10 7	3028
	α Pegasi	W.	44 6 52	3257	45 31 54	3209	46 57 53	3164	48 24 45	3124
	Sun	E.	38 59 31	3040	37 30 8	3027	36 0 29	3014	34 30 33	3001
31	Fomalhaut	W.	70 43 36	2905	72 15 48	2883	73 48 28	2862	75 21 35	2843
	α Pegasi	W.	55 50 48	2947	57 22 7	2918	58 54 3	2889	60 26 36	2862
	Sun	E.	26 57 20	2953	25 26 8	2947	23 54 49	2943	22 23 25	2942

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
22	Antares	W.	51° 37′ 29″	3105	53° 5′ 32″	3109	54° 33′ 31″	3112	56° 1′ 26″	3114
	Fomalhaut	E.	40 38 26	3902	39 25 8	3967	38 12 56	4039	37 1 55	4119
	α Pegasi	E.	53 46 43	3454	52 25 27	3479	51 4 39	3505	49 44 20	3533
	Venus	E.	78 3 53	3416	76 41 55	3424	75 20 6	3431	73 58 25	3438
	α Arietis	E.	96 7 31	3139	94 40 9	3146	93 12 55	3152	91 45 48	3158
	Sun	E.	122 27 39	3393	121 5 14	3400	119 42 57	3406	118 20 47	3413
23	Antares	W.	63 20 14	3126	64 47 52	3129	66 15 27	3130	67 43 0	3131
	Fomalhaut	E.	31 28 39	4677	30 27 20	4834	29 28 12	5014	28 31 28	5219
	α Pegasi	E.	43 11 7	3704	41 54 24	3746	40 38 26	3793	39 23 17	3844
	Venus	E.	67 11 45	3465	65 50 42	3470	64 29 44	3473	63 8 50	3477
	α Arietis	E.	84 31 55	3183	83 5 26	3188	81 39 3	3192	80 12 44	3196
	Sun	E.	111 31 34	3437	110 9 59	3440	108 48 28	3443	107 27 0	3446
24	Antares	W.	75 0 34	3131	76 28 6	3130	77 55 39	3129	79 23 13	3129
	Venus	E.	56 25 1	3484	55 4 19	3484	53 43 37	3484	52 22 55	3483
	α Arietis	E.	73 2 14	3211	71 36 18	3214	70 10 25	3216	68 44 35	3218
	Sun	E.	100 40 14	3452	99 18 56	3452	97 57 38	3451	96 36 19	3449
25	Antares	W.	86 41 43	3113	88 9 37	3109	89 37 36	3105	91 5 40	3100
	α Aquilæ	W.	43 40 54	4126	44 50 31	4066	46 1 6	4012	47 12 34	3960
	Venus	E.	45 38 56	3471	44 17 59	3466	42 56 57	3461	41 35 49	3455
	α Arietis	E.	61 35 55	3225	60 10 16	3227	58 44 39	3228	57 19 3	3229
	Sun	E.	89 49 9	3435	88 27 32	3431	87 5 51	3426	85 44 4	3421
26	Antares	W.	98 27 39	3069	99 56 26	3062	101 25 22	3055	102 54 27	3047
	α Aquilæ	W.	53 21 39	3751	54 37 32	3716	55 54 2	3682	57 11 8	3651
	Venus	E.	34 48 32	3423	33 26 41	3415	32 4 41	3406	30 42 31	3397
	α Arietis	E.	50 11 29	3239	48 46 6	3242	47 20 47	3247	45 55 33	3251
	Sun	E.	78 53 29	3387	77 30 58	3379	76 8 17	3370	74 45 26	3361
27	α Aquilæ	W.	63 44 39	3511	65 4 51	3486	66 25 31	3462	67 46 38	3438
	α Arietis	E.	38 51 14	3295	37 26 57	3311	36 2 58	3329	34 39 20	3351
	Sun	E.	67 48 28	3310	66 24 28	3298	65 0 14	3286	63 35 46	3274
28	α Aquilæ	W.	74 38 39	3329	76 2 17	3309	77 26 18	3290	78 50 41	3271
	Fomalhaut	W.	42 7 19	3618	43 25 34	3560	44 44 52	3506	46 5 9	3457
	α Pegasi	W.	28 49 0	4316	29 55 38	4166	31 4 36	4035	32 15 41	3918
	Sun	E.	56 29 48	3209	55 3 50	3195	53 37 35	3181	52 11 3	3168
29	α Aquilæ	W.	85 58 2	3183	87 24 32	3167	88 51 21	3151	90 18 29	3137
	Fomalhaut	W.	52 59 37	3247	54 24 51	3211	55 50 47	3177	57 17 24	3145
	α Pegasi	W.	38 37 19	3487	39 57 58	3422	41 19 50	3363	42 42 49	3307
	Sun	E.	44 54 12	3096	43 25 58	3082	41 57 26	3068	40 28 37	3054
30	Fomalhaut	W.	64 39 45	3001	66 9 56	2976	67 40 39	2951	69 11 53	2928
	α Pegasi	W.	49 52 26	3084	51 20 55	3047	52 50 10	3012	54 20 8	2978
	Sun	E.	33 0 22	2989	31 29 56	2978	29 59 16	2968	28 28 23	2960
31	Fomalhaut	W.	76 55 7	2824	78 29 4	2805	80 3 25	2788	81 38 9	2770
	α Pegasi	W.	61 59 43	2837	63 33 23	2812	65 7 35	2788	66 42 18	2766
	Sun	E.	20 52 0	2946	19 20 40	2956	17 49 32	2973	16 18 46	3001

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from	
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.		Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Tues.	1	4 37 7.03	10.237	N.22 5 3.7	+20.23	15 48.30	68.42	2 26.84	0.380
Wed.	2	4 41 12.94	10.253	22 12 57.9	19.26	15 48.17	68.47	2 17.53	0.396
Thur.	3	4 45 19.21	10.269	22 20 28.9	18.29	15 48.04	68.53	2 7.85	0.412
Frid.	4	4 49 25.84	10.283	22 27 36.3	+17.31	15 47.92	68.58	1 57.80	0.426
Sat.	5	4 53 32.82	10.297	22 34 20.2	16.33	15 47.80	68.63	1 47.40	0.440
SUN.	6	4 57 40.12	10.310	22 40 40.5	15.34	15 47.69	68.68	1 36.69	0.453
Mon.	7	5 1 47.71	10.322	22 46 36.9	+14.35	15 47.58	68 72	1 25.69	0.465
Tues.	8	5 5 55.57	10.333	22 52 9.4	13.35	15 47.48	68.76	1 14.42	0.476
Wed.	9	5 10 3.67	10.343	22 57 17.7	12.34	15 47.38	68.79	1 2.90	0.486
Thur.	10	5 14 12.00	10.352	23 2 1.8	+11.33	15 47.29	68.82	0 51.16	0.495
Frid.	11	5 18 20.55	10.360	23 6 21.5	10.31	15 47.20	68.85	0 39.20	0.503
Sat.	12	5 22 29.28	10.367	23 10 16.8	9.29	15 47.11	68.88	0 27.06	0.510
SUN.	13	5 26 38.18	10.373	23 13 47.6	+ 8.27	15 47.03	68.90	0 14.75	0.516
Mon.	14	5 30 47.22	10.379	23 16 53.8	7.24	15 46.95	68.92	0 2.30	0.522
Tues.	15	5 34 56.39	10.384	23 19 35.3	6.21	15 46.87	68.93	0 10.29	0.527
Wed.	16	5 39 5.68	10.388	23 21 52.2	+ 5.19	15 46.80	68.95	0 22.99	0.531
Thur.	17	5 43 15.07	10.392	23 23 44.3	4.16	15 46.73	68.96	0 35.79	0.535
Frid.	18	5 47 24.51	10.394	23 25 11.7	3.13	15 46.66	68.97	0 48.64	0.537
Sat.	19	5 51 34.01	10.396	23 26 14.3	+ 2.09	15 46.60	68.98	1 1.54	0.539
SUN.	20	5 55 43.54	10.397	23 26 52.1	1.06	15 46.54	68.98	1 14.47	0.540
Mon.	21	5 59 53.08	10.397	23 27 5.1	+ 0.02	15 46.48	68.98	1 27.42	0.540
Tues.	22	6 4 2.62	10.397	23 26 53.3	− 1.01	15 46.43	68.98	1 40.36	0.540
Wed.	23	6 8 12.12	10.395	23 26 16.6	2.04	15 46.38	68.97	1 53.26	0.538
Thur.	24	6 12 21.57	10.392	23 25 15.2	3.07	15 46.33	68.96	2 6.11	0.535
Frid.	25	6 16 30.94	10.388	23 23 49.0	− 4.10	15 46.29	68.94	2 18.90	0.531
Sat.	26	6 20 40.21	10.383	23 21 58.3	5.13	15 46.25	68.92	2 31.58	0.526
SUN.	27	6 24 49.35	10.377	23 19 42.9	6.15	15 46.22	68.90	2 44.13	0.520
Mon.	28	6 28 58.34	10.370	23 17 2.9	− 7.17	15 46.19	68.87	2 56.53	0.513
Tues.	29	6 33 7.15	10.363	23 13 58.3	8.19	15 46.17	68.84	3 8.76	0.506
Wed.	30	6 37 15.77	10.354	23 10 29.3	9.21	15 46.16	68.81	3 20.78	0.497
Thur.	31	6 41 24.15	10.344	N.23 6 36.0	−10.22	15 46.15	68.78	3 32.58	0.487

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^s.19$ from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to / Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Tues.	1	4 37 7.46	10.236	N. 22 5 4.5	+20.23	2 26.83	0.380	4 39 34.29
Wed.	2	4 41 13.33	10.252	22 12 58.6	19.26	2 17.52	0.396	4 43 30.85
Thur.	3	4 45 19.57	10.268	22 20 29.5	18.29	2 7.84	0.412	4 47 27.40
Frid.	4	4 49 26.17	10.282	22 27 36.9	+17.31	1 57.79	0.426	4 51 23.96
Sat.	5	4 53 33.12	10.296	22 34 20.7	16.33	1 47.39	0.440	4 55 20.51
SUN.	6	4 57 40.39	10.309	22 40 40.9	15.34	1 36.68	0.453	4 59 17.07
Mon.	7	5 1 47.95	10.321	22 46 37.2	+14.35	1 25.68	0.465	5 3 13.63
Tues.	8	5 5 55.78	10.332	22 52 9.6	13.35	1 14.41	0.476	5 7 10.19
Wed.	9	5 10 3.85	10.342	22 57 17.9	12.34	1 2.89	0.486	5 11 6.74
Thur.	10	5 14 12.15	10.351	23 2 1.9	+11.33	0 51.15	0.495	5 15 3.30
Frid.	11	5 18 20.66	10.359	23 6 21.5	10.31	0 39.19	0.503	5 18 59.85
Sat.	12	5 22 29.36	10.366	23 10 16.8	9.29	0 27.05	0.510	5 22 56.41
SUN.	13	5 26 38.22	10.372	23 13 47.6	+ 8.27	0 14.75	0.516	5 26 52.97
Mon.	14	5 30 47.23	10.378	23 16 53.8	7.24	0 2.30	0.522	5 30 49.53
Tues.	15	5 34 56.37	10.383	23 19 35.3	6.21	0 10.29	0.527	5 34 46.08
Wed.	16	5 39 5.62	10.387	23 21 52.2	+ 5.19	0 22.99	0.531	5 38 42.64
Thur.	17	5 43 14.97	10.391	23 23 44.3	4.16	0 35.78	0.535	5 42 39.19
Frid.	18	5 47 24.38	10.393	23 25 11.7	3.13	0 48.63	0.537	5 46 35.75
Sat.	19	5 51 33.84	10.395	23 26 14.3	+ 2.09	1 1.53	0.539	5 50 32.31
SUN.	20	5 55 43.33	10.396	23 26 52.1	1.06	1 14.46	0.540	5 54 28.87
Mon.	21	5 59 52.83	10.396	23 27 5.1	+ 0.02	1 27.41	0.540	5 58 25.42
Tues.	22	6 4 2.33	10.396	23 26 53.3	− 1.01	1 40.35	0.540	6 2 21.98
Wed.	23	6 8 11.79	10.394	23 26 16.7	2.04	1 53.25	0.538	6 6 18.54
Thur.	24	6 12 21.20	10.391	23 25 15.3	3.07	2 6.10	0.535	6 10 15.10
Frid.	25	6 16 30.54	10.387	23 23 49.2	− 4.10	2 18.88	0.531	6 14 11.65
Sat.	26	6 20 39.77	10.382	23 21 58.5	5.13	2 31.56	0.526	6 18 8.21
SUN.	27	6 24 48.87	10.376	23 19 43.2	6.15	2 44.11	0.520	6 22 4.76
Mon.	28	6 28 57.83	10.369	23 17 3.2	− 7.17	2 56.51	0.513	6 26 1.32
Tues.	29	6 33 6.61	10.362	23 13 58.7	8.19	3 8.73	0.506	6 29 57.88
Wed.	30	6 37 15.19	10.353	23 10 29.8	9.21	3 20.75	0.497	6 33 54.44
Thur.	31	6 41 23.54	10.343	N. 23 6 36.6	−10.22	3 32.55	0.487	6 37 50.99

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

Diff. for 1 Hour,
+ 9s.8565.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S						Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	152	70 52 7.2	51 52.6	143.71	− 0.79	0.0062275	+ 25.9	19 17 15.60
2	153	71 49 35.7	49 21.0	143.67	0.79	0.0062885	24.9	19 13 19.69
3	154	72 47 3.3	46 48.4	143.63	0.75	0.0063471	23.9	19 9 23.78
4	155	73 44 30.0	44 14.9	143.59	− 0.69	0.0064033	+ 22.9	19 5 27.88
5	156	74 41 55.6	41 40.4	143.54	0.61	0.0064571	21.9	19 1 31.97
6	157	75 39 20.1	39 4.8	143.50	0.50	0.0065086	21.0	18 57 36.06
7	158	76 36 43.5	36 28.0	143.45	− 0.37	0.0065579	+ 20.1	18 53 40.15
8	159	77 34 5.9	33 50.2	143.41	0.23	0.0066050	19.2	18 49 44.23
9	160	78 31 27.3	31 11.4	143.36	− 0.09	0.0066500	18.3	18 45 48.31
10	161	79 28 47.7	28 31.7	143.32	+ 0.05	0.0066930	+ 17.5	18 41 52.39
11	162	80 26 7.0	25 50.9	143.28	0.18	0.0067343	16.8	18 37 56.49
12	163	81 23 25.4	23 9.1	143.24	0.29	0.0067740	16.2	18 34 0.58
13	164	82 20 43.0	20 26.5	143.21	+ 0.38	0.0068121	+ 15.6	18 30 4.66
14	165	83 17 59.8	17 43.1	143.18	0.44	0.0068488	15.0	18 26 8.75
15	166	84 15 15.8	14 59.0	143.15	0.46	0.0068840	14.4	18 22 12.84
16	167	85 12 31.1	12 14.2	143.13	+ 0.46	0.0069178	+ 13.8	18 18 16.93
17	168	86 9 45.9	9 28.8	143.11	0.43	0.0069502	13.2	18 14 21.02
18	169	87 7 0.3	6 43.0	143.09	0.37	0.0069812	12.6	18 10 25.11
19	170	88 4 14.3	3 56.8	143.08	+ 0.29	0.0070108	+ 12.0	18 6 29.20
20	171	89 1 28.0	1 10.4	143.07	0.19	0.0070389	11.4	18 2 33.30
21	172	89 58 41.5	58 23.7	143.06	+ 0.07	0.0070655	10.7	17 58 37.38
22	173	90 55 54.8	55 36.9	143.05	− 0.06	0.0070905	+ 10.0	17 54 41.47
23	174	91 53 8.1	52 50.0	143.05	0.19	0.0071137	9.2	17 50 45.56
24	175	92 50 21.4	50 3.1	143.05	0.31	0.0071349	8.4	17 46 49.65
25	176	93 47 34.6	47 16.2	143.05	− 0.42	0.0071541	+ 7.5	17 42 53.73
26	177	94 44 47.9	44 29.3	143.05	0.51	0.0071711	6.6	17 38 57.82
27	178	95 42 1.2	41 42.4	143.05	0.57	0.0071857	5.6	17 35 1.91
28	179	96 39 14.5	38 55.6	143.05	− 0.61	0.0071979	+ 4.6	17 31 6.01
29	180	97 36 27.9	36 8.8	143.06	0.62	0.0072076	3.5	17 27 10.09
30	181	98 33 41.4	33 22.2	143.06	0.59	0.0072147	2.4	17 23 14.18
31	182	99 30 54.8	30 35.5	143.05	− 0.52	0.0072191	+ 1.3	17 19 18.27

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, — $9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 51.9	15 57.4	58 6.6	+1.75	58 27.0	+1.63	23 56.0	2.35	28.4
2	16 2.5	16 7.1	58 45.8	1.48	59 2.6	1.31	☌		29.4
3	16 11.0	16 14.3	59 17.1	1.10	59 29.0	0.88	0 53.5	2.44	0.9
4	16 16.8	16 18.6	59 38.2	+0.65	59 44.7	+0.43	1 52.5	2.47	1.9
5	16 19.6	16 19.8	59 48.4	+0.20	59 49.4	−0.02	2 51.6	2.44	2.9
6	16 19.4	16 18.4	59 47.8	−0.23	59 44.0	0.40	3 49.5	2.37	3.9
7	16 16.8	16 14.7	59 38.2	−0.56	59 30.6	−0.70	4 45.3	2.28	4.9
8	16 12.2	16 9.4	59 21.4	0.82	59 11.0	0.91	5 38.9	2.19	5.9
9	16 6.3	16 2.9	58 59.5	0.99	58 47.2	1.06	6 30.6	2.12	6.9
10	15 59.4	15 55.8	58 34.3	−1.10	58 20.9	−1.14	7 20.9	2.08	7.9
11	15 52.0	15 48.1	58 7.1	1.17	57 52.9	1.19	8 10.7	2.07	8.9
12	15 44.2	15 40.2	57 38.4	1.21	57 23.8	1.23	9 0.4	2.08	9.9
13	15 36.2	15 32.1	57 9.0	−1.24	56 54.1	−1.25	9 50.6	2.10	10.9
14	15 28.0	15 23.9	56 39.1	1.25	56 24.1	1.24	10 41.3	2.12	11.9
15	15 19.9	15 15.9	56 9.2	1.23	55 54.6	1.21	11 32.2	2.12	12.9
16	15 12.0	15 8.2	55 40.2	−1.18	55 26.2	−1.14	12 23.0	2.10	13.9
17	15 4.6	15 1.2	55 12.9	1.08	55 0.4	1.00	13 13.1	2.06	14.9
18	14 58.0	14 55.1	54 48.8	0.92	54 38.3	0.82	14 1.8	2.00	15.9
19	14 52.7	14 50.6	54 29.2	−0.70	54 21.6	−0.56	14 48.9	1.93	16.9
20	14 49.0	14 47.9	54 15.7	0.41	54 11.7	−0.25	15 34.4	1.86	17.9
21	14 47.4	14 47.5	54 9.7	−0.08	54 9.9	+0.11	16 18.5	1.81	18.9
22	14 48.1	14 49.4	54 12.4	+0.31	54 17.3	+0.51	17 1.6	1.79	19.9
23	14 51.4	14 54.1	54 24.6	0.71	54 34.4	0.92	17 44.4	1.79	20.9
24	14 57.4	15 1.5	54 46.7	1.13	55 1.5	1.33	18 27.7	1.83	21.9
25	15 6.1	15 11.5	55 18.7	+1.53	55 38.1	+1.70	19 12.2	1.90	22.9
26	15 17.3	15 23.5	55 59.5	1.86	56 22.6	1.99	19 58.9	2.00	23.9
27	15 30.2	15 37.2	56 47.2	2.10	57 12.9	2.17	20 48.5	2.14	24.9
28	15 44.4	15 51.6	57 39.2	+2.20	58 5.7	+2.19	21 41.4	2.28	25.9
29	15 58.7	16 5.5	58 31.7	2.12	58 56.6	2.01	22 37.8	2.42	26.9
30	16 11.8	16 17.6	59 19.9	1.85	59 41.0	1.64	23 36.9	2.51	27.9
31	16 22.5	16 26.7	59 59.3	+1.39	60 14.4	+1.11	☌		28.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 1.					**THURSDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 42 49.43	2.3131	N.14 44 54.7	6.949	0	5 38 52.60	2.5031	N.18 28 58.4	2.036
1	3 45 8.36	2.3179	14 51 49.3	6.871	1	5 41 22.86	2.5055	18 30 56.9	1.913
2	3 47 27.58	2.3228	14 58 39.2	6.791	2	5 43 53.26	2.5078	18 32 48.0	1.790
3	3 49 47.10	2.3277	15 5 24.2	6.709	3	5 46 23.80	2.5101	18 34 31.7	1.667
4	3 52 6.90	2.3324	15 12 4.3	6.627	4	5 48 54.48	2.5124	18 36 8.0	1.543
5	3 54 26.99	2.3372	15 18 39.4	6.543	5	5 51 25.29	2.5145	18 37 36.9	1.420
6	3 56 47.36	2.3419	15 25 9.5	6.459	6	5 53 56.22	2.5165	18 38 58.4	1.296
7	3 59 8.02	2.3467	15 31 34.5	6.373	7	5 56 27.27	2.5184	18 40 12.4	1.171
8	4 1 28.96	2.3514	15 37 54.3	6.286	8	5 58 58.43	2.5202	18 41 18.9	1.046
9	4 3 50.19	2.3561	15 44 8.8	6.198	9	6 1 29.69	2.5219	18 42 17.9	0.921
10	4 6 11.70	2.3608	15 50 18.1	6.110	10	6 4 1.05	2.5235	18 43 9.4	0.796
11	4 8 33.49	2.3655	15 56 22.0	6.020	11	6 6 32.51	2.5251	18 43 53.4	0.670
12	4 10 55.56	2.3701	16 2 20.5	5.929	12	6 9 4.06	2.5265	18 44 29.8	0.543
13	4 13 17.90	2.3747	16 8 13.5	5.837	13	6 11 35.69	2.5278	18 44 58.6	0.416
14	4 15 40.52	2.3793	16 14 0.9	5.743	14	6 14 7.40	2.5291	18 45 19.8	0.289
15	4 18 3.41	2.3838	16 19 42.7	5.649	15	6 16 39.19	2.5304	18 45 33.3	0.162
16	4 20 26.57	2.3883	16 25 18.8	5.554	16	6 19 11.05	2.5315	18 45 39.2	+ 0.035
17	4 22 50.00	2.3927	16 30 49.2	5.458	17	6 21 42.97	2.5325	18 45 37.5	− 0.092
18	4 25 13.69	2.3970	16 36 13.8	5.361	18	6 24 14.95	2.5334	18 45 28.1	0.220
19	4 27 37.64	2.4014	16 41 32.5	5.262	19	6 26 46.98	2.5342	18 45 11.1	0.347
20	4 30 1.86	2.4058	16 46 45.3	5.163	20	6 29 19.05	2.5349	18 44 46.4	0.475
21	4 32 26.34	2.4101	16 51 52.1	5.063	21	6 31 51.16	2.5355	18 44 14.1	0.603
22	4 34 51.07	2.4143	16 56 52.8	4.962	22	6 34 23.31	2.5361	18 43 34.1	0.731
23	4 37 16.05	2.4185	N.17 1 47.5	4.860	23	6 36 55.49	2.5365	N.18 42 46.4	0.859
	WEDNESDAY 2.					**FRIDAY 4.**			
0	4 39 41.29	2.4227	N.17 6 36.0	4.757	0	6 39 27.69	2.5368	N.18 41 51.0	0.987
1	4 42 6.77	2.4267	17 11 18.3	4.652	1	6 41 59.91	2.5371	18 40 48.0	1.114
2	4 44 32.49	2.4307	17 15 54.3	4.547	2	6 44 32.14	2.5372	18 39 37.3	1.242
3	4 46 58.45	2.4347	17 20 24.0	4.442	3	6 47 4.37	2.5373	18 38 18.9	1.370
4	4 49 24.65	2.4387	17 24 47.4	4.336	4	6 49 36.61	2.5373	18 36 52.9	1.497
5	4 51 51.09	2.4426	17 29 4.3	4.228	5	6 52 8.84	2.5372	18 35 19.2	1.625
6	4 54 17.76	2.4463	17 33 14.7	4.119	6	6 54 41.07	2.5370	18 33 37.9	1.752
7	4 56 44.65	2.4500	17 37 18.6	4.010	7	6 57 13.28	2.5367	18 31 49.0	1.879
8	4 59 11.76	2.4537	17 41 15.9	3.899	8	6 59 45.47	2.5362	18 29 52.5	2.006
9	5 1 39.09	2.4573	17 45 6.5	3.788	9	7 2 17.63	2.5357	18 27 48.3	2.132
10	5 4 6.64	2.4610	17 48 50.4	3.676	10	7 4 49.76	2.5352	18 25 36.6	2.258
11	5 6 34.41	2.4645	17 52 27.6	3.564	11	7 7 21.86	2.5346	18 23 17.3	2.385
12	5 9 2.38	2.4679	17 55 58.1	3.451	12	7 9 53.91	2.5338	18 20 50.4	2.511
13	5 11 30.55	2.4712	17 59 21.7	3.336	13	7 12 25.91	2.5329	18 18 16.0	2.636
14	5 13 58.92	2.4745	18 2 38.4	3.221	14	7 14 57.86	2.5320	18 15 34.1	2.761
15	5 16 27.49	2.4777	18 5 48.2	3.106	15	7 17 29.75	2.5310	18 12 44.7	2.886
16	5 18 56.25	2.4808	18 8 51.1	2.989	16	7 20 1.58	2.5300	18 9 47.8	3.010
17	5 21 25.19	2.4838	18 11 46.9	2.872	17	7 22 33.35	2.5289	18 6 43.5	3.134
18	5 23 54.31	2.4868	18 14 35.7	2.754	18	7 25 5.05	2.5277	18 3 31.7	3.257
19	5 26 23.61	2.4897	18 17 17.4	2.636	19	7 27 36.67	2.5263	18 0 12.6	3.380
20	5 28 53.08	2.4926	18 19 52.0	2.517	20	7 30 8.20	2.5248	17 56 46.1	3.503
21	5 31 22.72	2.4954	18 22 19.4	2.397	21	7 32 39.64	2.5233	17 53 12.3	3.624
22	5 33 52.53	2.4981	18 24 39.6	2.277	22	7 35 10.99	2.5217	17 49 31.2	3.746
23	5 36 22.49	2.5006	18 26 52.6	2.157	23	7 37 42.24	2.5200	17 45 42.8	3.867
24	5 38 52.60	2.5031	N.18 28 58.4	2.036	24	7 40 13.39	2.5183	N.17 41 47.1	3.988

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 5.					**MONDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 40 13.39	2.5183	N.17 41 47.1	3.988	0	9 38 2.22	2.3762	N.12 26 53.8	8.762
1	7 42 44.44	2.5165	17 37 44.2	4.107	1	9 40 24.69	2.3727	12 18 5.9	8.836
2	7 45 15.37	2.5146	17 33 34.2	4.226	2	9 42 46.95	2.3692	12 9 13.5	8.909
3	7 47 46.19	2.5127	17 29 17.1	4.344	3	9 45 8.99	2.3656	12 0 16.8	8.981
4	7 50 16.89	2.5107	17 24 52.9	4.462	4	9 47 30.82	2.3621	11 51 15.8	9.051
5	7 52 47.47	2.5087	17 20 21.6	4.580	5	9 49 52.44	2.3586	11 42 10.7	9.119
6	7 55 17.93	2.5065	17 15 43.3	4.697	6	9 52 13.85	2.3551	11 33 1.5	9.187
7	7 57 48.25	2.5042	17 10 58.0	4.812	7	9 54 35.05	2.3516	11 23 48.2	9.254
8	8 0 18.44	2.5020	17 6 5.8	4.927	8	9 56 56.04	2.3480	11 14 31.0	9.319
9	8 2 48.49	2.4997	17 1 6.8	5.041	9	9 59 16.81	2.3444	11 5 9.9	9.384
10	8 5 18.40	2.4973	16 56 0.9	5.154	10	10 1 37.37	2.3410	10 55 44.9	9.447
11	8 7 48.16	2.4948	16 50 48.3	5.267	11	10 3 57.73	2.3376	10 46 16.2	9.509
12	8 10 17.78	2.4923	16 45 28.9	5.379	12	10 6 17.88	2.3341	10 36 43.8	9.570
13	8 12 47.24	2.4897	16 40 2.8	5.490	13	10 8 37.82	2.3307	10 27 7.8	9.630
14	8 15 16.54	2.4870	16 34 30.1	5.600	14	10 10 57.56	2.3272	10 17 28.2	9.688
15	8 17 45.68	2.4843	16 28 50.8	5.710	15	10 13 17.09	2.3238	10 7 45.2	9.745
16	8 20 14.66	2.4816	16 23 4.9	5.818	16	10 15 36.42	2.3205	9 57 58.8	9.802
17	8 22 43.48	2.4789	16 17 12.6	5.926	17	10 17 55.55	2.3171	9 48 9.0	9.858
18	8 25 12.13	2.4760	16 11 13.8	6.033	18	10 20 14.47	2.3137	9 38 15.9	9.912
19	8 27 40.60	2.4731	16 5 8.6	6.139	19	10 22 33.20	2.3105	9 28 19.6	9.963
20	8 30 8.90	2.4702	15 58 57.1	6.243	20	10 24 51.73	2.3072	9 18 20.3	10.014
21	8 32 37.02	2.4672	15 52 39.4	6.347	21	10 27 10.06	2.3039	9 8 17.9	10.065
22	8 35 4.96	2.4642	15 46 15.5	6.450	22	10 29 28.19	2.3006	8 58 12.5	10.114
23	8 37 32.72	2.4612	N.15 39 45.4	6.553	23	10 31 46.13	2.2974	N. 8 48 4.2	10.162
	SUNDAY 6.					**TUESDAY 8.**			
0	8 40 0.30	2.4581	N.15 33 9.1	6.655	0	10 34 3.88	2.2942	N. 8 37 53.1	10.208
1	8 42 27.69	2.4549	15 26 26.8	6.754	1	10 36 21.44	2.2911	8 27 39.2	10.254
2	8 44 54.89	2.4517	15 19 38.6	6.853	2	10 38 38.81	2.2879	8 17 22.6	10.296
3	8 47 21.89	2.4484	15 12 44.5	6.951	3	10 40 55.99	2.2848	8 7 3.4	10.342
4	8 49 48.70	2.4452	15 5 44.5	7.048	4	10 43 12.98	2.2817	7 56 41.6	10.383
5	8 52 15.32	2.4421	14 58 38.7	7.144	5	10 45 29.79	2.2787	7 46 17.4	10.423
6	8 54 41.75	2.4388	14 51 27.2	7.238	6	10 47 46.42	2.2757	7 35 50.8	10.463
7	8 57 7.98	2.4354	14 44 10.1	7.332	7	10 50 2.87	2.2727	7 25 21.8	10.502
8	8 59 34.00	2.4320	14 36 47.3	7.426	8	10 52 19.14	2.2697	7 14 50.5	10.539
9	9 1 59.82	2.4287	14 29 18.9	7.519	9	10 54 35.23	2.2668	7 4 17.1	10.574
10	9 4 25.44	2.4253	14 21 45.0	7.609	10	10 56 51.15	2.2639	6 53 41.6	10.610
11	9 6 50.85	2.4218	14 14 5.8	7.698	11	10 59 6.90	2.2611	6 43 3.9	10.645
12	9 9 16.06	2.4184	14 6 21.3	7.786	12	11 1 22.48	2.2583	6 32 24.2	10.677
13	9 11 41.06	2.4149	13 58 31.5	7.874	13	11 3 37.89	2.2555	6 21 42.6	10.708
14	9 14 5.85	2.4114	13 50 36.4	7.961	14	11 5 53.14	2.2527	6 10 59.2	10.739
15	9 16 30.43	2.4080	13 42 36.2	8.046	15	11 8 8.22	2.2500	6 0 13.9	10.769
16	9 18 54.81	2.4046	13 34 30.9	8.130	16	11 10 23.14	2.2474	5 49 26.9	10.797
17	9 21 18.98	2.4011	13 26 20.6	8.212	17	11 12 37.91	2.2448	5 38 38.3	10.823
18	9 23 42.94	2.3976	13 18 5.4	8.294	18	11 14 52.52	2.2422	5 27 48.1	10.849
19	9 26 6.69	2.3940	13 9 45.3	8.375	19	11 17 6.98	2.2397	5 16 56.4	10.874
20	9 28 30.22	2.3904	13 1 20.4	8.455	20	11 19 21.28	2.2371	5 6 3.2	10.898
21	9 30 53.54	2.3869	12 52 50.7	8.534	21	11 21 35.43	2.2347	4 55 8.6	10.921
22	9 33 16.65	2.3833	12 44 16.3	8.612	22	11 23 49.44	2.2323	4 44 12.7	10.942
23	9 35 39.54	2.3797	12 35 37.3	8.688	23	11 26 3.31	2.2299	4 33 15.6	10.962
24	9 38 2.22	2.3762	N.12 26 53.8	8.762	24	11 28 17.03	2.2275	N. 4 22 17.3	10.981

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 28 17.03	2.2275	N. 4 22 17.3	10.981
1	11 30 30.61	2.2252	4 11 17.9	10.999
2	11 32 44.06	2.2230	4 0 17.4	11.017
3	11 34 57.37	2.2208	3 49 15.9	11.033
4	11 37 10.55	2.2186	3 38 13.5	11.047
5	11 39 23.60	2.2165	3 27 10.3	11.061
6	11 41 36.53	2.2144	3 16 6.2	11.074
7	11 43 49.33	2.2123	3 5 1.4	11.085
8	11 46 2.01	2.2103	2 53 56.0	11.095
9	11 48 14.57	2.2083	2 42 50.0	11.104
10	11 50 27.01	2.2064	2 31 43.5	11.112
11	11 52 39.34	2.2046	2 20 36.5	11.120
12	11 54 51.56	2.2028	2 9 29.1	11.127
13	11 57 3.67	2.2010	1 58 21.3	11.132
14	11 59 15.68	2.1992	1 47 13.3	11.135
15	12 1 27.58	2.1975	1 36 5.1	11.137
16	12 3 39.38	2.1958	1 24 56.8	11.140
17	12 5 51.08	2.1942	1 13 48.3	11.142
18	12 8 2.69	2.1927	1 2 39.8	11.141
19	12 10 14.21	2.1912	0 51 31.4	11.140
20	12 12 25.64	2.1897	0 40 23.0	11.138
21	12 14 36.98	2.1883	0 29 14.8	11.135
22	12 16 48.24	2.1869	0 18 6.8	11.131
23	12 18 59.41	2.1855	N. 0 6 59.1	11.125

THURSDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 21 10.50	2.1843	S. 0 4 8.2	11.118
1	12 23 21.52	2.1831	0 15 15.1	11.111
2	12 25 32.47	2.1818	0 26 21.6	11.103
3	12 27 43.34	2.1806	0 37 27.5	11.093
4	12 29 54.14	2.1795	0 48 32.8	11.083
5	12 32 4.88	2.1785	0 59 37.5	11.072
6	12 34 15.56	2.1775	1 10 41.5	11.060
7	12 36 26.18	2.1765	1 21 44.7	11.047
8	12 38 36.74	2.1755	1 32 47.0	11.032
9	12 40 47.24	2.1746	1 43 48.5	11.017
10	12 42 57.69	2.1737	1 54 49.1	11.001
11	12 45 8.09	2.1729	2 5 48.6	10.983
12	12 47 18.44	2.1722	2 16 47.0	10.964
13	12 49 28.75	2.1715	2 27 44.3	10.946
14	12 51 39.02	2.1708	2 38 40.5	10.926
15	12 53 49.24	2.1701	2 49 35.4	10.904
16	12 55 59.43	2.1695	3 0 29.0	10.882
17	12 58 9.58	2.1688	3 11 21.3	10.860
18	13 0 19.69	2.1683	3 22 12.2	10.836
19	13 2 29.77	2.1678	3 33 1.6	10.811
20	13 4 39.83	2.1674	3 43 49.5	10.785
21	13 6 49.86	2.1670	3 54 35.8	10.758
22	13 8 59.87	2.1667	4 5 20.5	10.731
23	13 11 9.86	2.1663	4 16 3.5	10.702
24	13 13 19.83	2.1660	S. 4 26 44.7	10.672

FRIDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 13 19.83	2.1660	S. 4 26 44.7	10.672
1	13 15 29.78	2.1658	4 37 24.1	10.642
2	13 17 39.72	2.1656	4 48 1.7	10.610
3	13 19 49.65	2.1653	4 58 37.3	10.578
4	13 21 59.56	2.1652	5 9 11.0	10.545
5	13 24 9.47	2.1651	5 19 42.7	10.511
6	13 26 19.37	2.1649	5 30 12.3	10.476
7	13 28 29.26	2.1649	5 40 39.8	10.440
8	13 30 39.16	2.1650	5 51 5.1	10.403
9	13 32 49.06	2.1650	6 1 28.1	10.365
10	13 34 58.96	2.1651	6 11 48.9	10.327
11	13 37 8.87	2.1652	6 22 7.3	10.287
12	13 39 18.78	2.1653	6 32 23.3	10.247
13	13 41 28.70	2.1654	6 42 36.9	10.206
14	13 43 38.63	2.1656	6 52 47.9	10.163
15	13 45 48.57	2.1658	7 2 56.4	10.120
16	13 47 58.53	2.1661	7 13 2.3	10.076
17	13 50 8.50	2.1663	7 23 5.5	10.032
18	13 52 18.48	2.1665	7 33 6.1	9.986
19	13 54 28.48	2.1669	7 43 3.9	9.939
20	13 56 38.51	2.1673	7 52 58.8	9.892
21	13 58 48.56	2.1677	8 2 50.9	9.844
22	14 0 58.63	2.1681	8 12 40.1	9.795
23	14 3 8.73	2.1685	S. 8 22 26.3	9.746

SATURDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 5 18.85	2.1690	S. 8 32 9.6	9.696
1	14 7 29.00	2.1694	8 41 49.8	9.644
2	14 9 39.18	2.1700	8 51 26.8	9.591
3	14 11 49.40	2.1706	9 1 0.7	9.538
4	14 13 59.65	2.1711	9 10 31.4	9.484
5	14 16 9.93	2.1716	9 19 58.8	9.430
6	14 18 20.24	2.1722	9 29 23.0	9.375
7	14 20 30.59	2.1728	9 38 43.8	9.318
8	14 22 40.98	2.1734	9 48 1.2	9.261
9	14 24 51.40	2.1740	9 57 15.1	9.203
10	14 27 1.86	2.1747	10 6 25.5	9.144
11	14 29 12.37	2.1755	10 15 32.4	9.085
12	14 31 22.92	2.1762	10 24 35.7	9.024
13	14 33 33.51	2.1769	10 33 35.3	8.963
14	14 35 44.14	2.1776	10 42 31.3	8.902
15	14 37 54.82	2.1783	10 51 23.6	8.840
16	14 40 5.54	2.1791	11 0 12.1	8.777
17	14 42 16.31	2.1798	11 8 56.8	8.713
18	14 44 27.12	2.1806	11 17 37.7	8.649
19	14 46 37.98	2.1814	11 26 14.7	8.583
20	14 48 48.89	2.1821	11 34 47.7	8.517
21	14 50 59.84	2.1829	11 43 16.7	8.449
22	14 53 10.84	2.1837	11 51 41.6	8.382
23	14 55 21.89	2.1847	12 0 2.5	8.314
24	14 57 33.00	2.1856	S. 12 8 19.3	8.245

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 13.					**TUESDAY 15.**				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	14 57 33.00	2.1856	S. 12 8 19.3	8.245	0	16 43 19.21	2.2161	S. 17 13 6.8	4.260
1	14 59 44.16	2.1864	12 16 31.9	8.175	1	16 45 32.18	2.2162	17 17 19.6	4.166
2	15 1 55.36	2.1871	12 24 40.3	8.105	2	16 47 45.16	2.2163	17 21 26.7	4.072
3	15 4 6.61	2.1879	12 32 44.5	8.034	3	16 49 58.14	2.2163	17 25 28.2	3.977
4	15 6 17.91	2.1887	12 40 44.4	7.963	4	16 52 11.12	2.2163	17 29 24.0	3.883
5	15 8 29.26	2.1896	12 48 40.0	7.891	5	16 54 24.10	2.2164	17 33 14.2	3.789
6	15 10 40.66	2.1905	12 56 31.3	7.818	6	16 56 37.09	2.2164	17 36 58.7	3.694
7	15 12 52.12	2.1914	13 4 18.2	7.744	7	16 58 50.07	2.2163	17 40 37.5	3.599
8	15 15 3.63	2.1922	13 12 0.6	7.669	8	17 1 3.05	2.2162	17 44 10.6	3.504
9	15 17 15.19	2.1930	13 19 38.5	7.594	9	17 3 16.02	2.2161	17 47 38.0	3.408
10	15 19 26.79	2.1938	13 27 11.9	7.518	10	17 5 28.98	2.2159	17 50 59.6	3.312
11	15 21 38.45	2.1947	13 34 40.7	7.443	11	17 7 41.93	2.2157	17 54 15.5	3.217
12	15 23 50.16	2.1956	13 42 5.0	7.367	12	17 9 54.87	2.2155	17 57 25.6	3.121
13	15 26 1.92	2.1964	13 49 24.7	7.288	13	17 12 7.79	2.2152	18 0 30.0	3.025
14	15 28 13.73	2.1972	13 56 39.6	7.209	14	17 14 20.69	2.2149	18 3 28.6	2.928
15	15 30 25.59	2.1980	14 3 49.8	7.131	15	17 16 33.58	2.2146	18 6 21.4	2.832
16	15 32 37.49	2.1987	14 10 55.3	7.052	16	17 18 46.44	2.2142	18 9 8.5	2.736
17	15 34 49.44	2.1996	14 17 56.1	6.973	17	17 20 59.28	2.2137	18 11 49.8	2.639
18	15 37 1.44	2.2004	14 24 52.1	6.892	18	17 23 12.09	2.2132	18 14 25.2	2.542
19	15 39 13.49	2.2012	14 31 43.2	6.811	19	17 25 24.87	2.2127	18 16 54.8	2.446
20	15 41 25.59	2.2020	14 38 29.4	6.730	20	17 27 37.62	2.2122	18 19 18.7	2.350
21	15 43 37.73	2.2027	14 45 10.8	6.649	21	17 29 50.34	2.2117	18 21 36.8	2.253
22	15 45 49.92	2.2035	14 51 47.3	6.566	22	17 32 3.02	2.2110	18 23 49.1	2.156
23	15 48 2.15	2.2042	S. 14 58 18.7	6.482	23	17 34 15.66	2.2103	S. 18 25 55.5	2.058
MONDAY 14.					**WEDNESDAY 16.**				
0	15 50 14.42	2.2049	S. 15 4 45.1	6.398	0	17 36 28.26	2.2096	S. 18 27 56.1	1.962
1	15 52 26.74	2.2057	15 11 6.5	6.314	1	17 38 40.82	2.2089	18 29 50.9	1.865
2	15 54 39.10	2.2063	15 17 22.8	6.230	2	17 40 53.33	2.2082	18 31 39.9	1.768
3	15 56 51.50	2.2070	15 23 34.1	6.145	3	17 43 5.80	2.2074	18 33 23.1	1.671
4	15 59 3.94	2.2077	15 29 40.2	6.059	4	17 45 18.22	2.2065	18 35 0.4	1.573
5	16 1 16.42	2.2083	15 35 41.2	5.973	5	17 47 30.58	2.2055	18 36 31.9	1.477
6	16 3 28.94	2.2090	15 41 37.0	5.887	6	17 49 42.88	2.2046	18 37 57.6	1.380
7	16 5 41.50	2.2096	15 47 27.6	5.799	7	17 51 55.13	2.2037	18 39 17.5	1.283
8	16 7 54.09	2.2101	15 53 12.9	5.712	8	17 54 7.32	2.2027	18 40 31.6	1.187
9	16 10 6.71	2.2106	15 58 53.0	5.624	9	17 56 19.45	2.2016	18 41 39.9	1.090
10	16 12 19.36	2.2112	16 4 27.8	5.536	10	17 58 31.51	2.2005	18 42 42.4	0.993
11	16 14 32.05	2.2118	16 9 57.3	5.447	11	18 0 43.51	2.1994	18 43 39.1	0.897
12	16 16 44.77	2.2123	16 15 21.5	5.358	12	18 2 55.44	2.1982	18 44 30.1	0.801
13	16 18 57.52	2.2128	16 20 40.3	5.268	13	18 5 7.30	2.1970	18 45 15.3	0.704
14	16 21 10.30	2.2132	16 25 53.7	5.178	14	18 7 19.08	2.1957	18 45 54.6	0.608
15	16 23 23.10	2.2135	16 31 1.7	5.088	15	18 9 30.79	2.1945	18 46 28.2	0.512
16	16 25 35.92	2.2139	16 36 4.3	4.997	16	18 11 42.42	2.1932	18 46 56.0	0.416
17	16 27 48.77	2.2143	16 41 1.4	4.906	17	18 13 53.97	2.1918	18 47 18.1	0.321
18	16 30 1.64	2.2147	16 45 53.0	4.815	18	18 16 5.43	2.1903	18 47 34.5	0.225
19	16 32 14.53	2.2150	16 50 39.2	4.723	19	18 18 16.81	2.1889	18 47 45.1	0.129
20	16 34 27.44	2.2152	16 55 19.8	4.631	20	18 20 28.10	2.1874	18 47 50.0	− 0.034
21	16 36 40.36	2.2155	16 59 54.9	4.538	21	18 22 39.30	2.1859	18 47 49.2	+ 0.061
22	16 38 53.30	2.2157	17 4 24.4	4.446	22	18 24 50.41	2.1844	18 47 42.7	0.156
23	16 41 6.25	2.2159	17 8 48.4	4.353	23	18 27 1.43	2.1829	18 47 30.5	0.250
24	16 43 19.21	2.2161	S. 17 13 6.8	4.260	24	18 29 12.36	2.1813	S. 18 47 12.7	0.344

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 29 12.36	2.1813	S. 18 47 12.7	0.344
1	18 31 23.19	2.1796	18 46 49.2	0.439
2	18 33 33.91	2.1778	18 46 20.0	0.533
3	18 35 44.53	2.1762	18 45 45.2	0.627
4	18 37 55.05	2.1744	18 45 4.8	0.720
5	18 40 5.46	2.1726	18 44 18.8	0.813
6	18 42 15.76	2.1707	18 43 27.2	0.907
7	18 44 25.95	2.1689	18 42 30.0	0.999
8	18 46 36.03	2.1671	18 41 27.3	1.091
9	18 48 46.00	2.1652	18 40 19.1	1.183
10	18 50 55.85	2.1632	18 39 5.3	1.275
11	18 53 5.58	2.1612	18 37 46.1	1.366
12	18 55 15.19	2.1592	18 36 21.4	1.457
13	18 57 24.68	2.1572	18 34 51.2	1.548
14	18 59 34.05	2.1551	18 33 15.6	1.638
15	19 1 43.29	2.1529	18 31 34.6	1.728
16	19 3 52.40	2.1508	18 29 48.2	1.818
17	19 6 1.39	2.1487	18 27 56.4	1.907
18	19 8 10.25	2.1465	18 25 59.3	1.997
19	19 10 18.97	2.1443	18 23 56.8	2.086
20	19 12 27.56	2.1421	18 21 49.0	2.173
21	19 14 36.02	2.1398	18 19 36.0	2.261
22	19 16 44.34	2.1375	18 17 17.7	2.348
23	19 18 52.52	2.1352	S. 18 14 54.2	2.436

FRIDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 21 0.56	2.1328	S. 18 12 25.4	2.523
1	19 23 8.46	2.1306	18 9 51.4	2.609
2	19 25 16.22	2.1282	18 7 12.3	2.694
3	19 27 23.84	2.1258	18 4 28.1	2.779
4	19 29 31.31	2.1233	18 1 38.8	2.864
5	19 31 38.64	2.1209	17 58 44.4	2.949
6	19 33 45.82	2.1184	17 55 44.9	3.033
7	19 35 52.85	2.1159	17 52 40.4	3.117
8	19 37 59.73	2.1135	17 49 30.9	3.200
9	19 40 6.47	2.1111	17 46 16.4	3.282
10	19 42 13.06	2.1085	17 42 57.0	3.365
11	19 44 19.49	2.1058	17 39 32.6	3.447
12	19 46 25.76	2.1032	17 36 3.3	3.528
13	19 48 31.88	2.1007	17 32 29.2	3.609
14	19 50 37.85	2.0982	17 28 50.2	3.690
15	19 52 43.67	2.0957	17 25 6.4	3.769
16	19 54 49.33	2.0930	17 21 17.9	3.848
17	19 56 54.83	2.0904	17 17 24.6	3.927
18	19 59 0.18	2.0878	17 13 26.6	4.006
19	20 1 5.37	2.0852	17 9 23.9	4.084
20	20 3 10.40	2.0825	17 5 16.5	4.162
21	20 5 15.27	2.0798	17 1 4.5	4.238
22	20 7 19.98	2.0772	16 56 47.9	4.314
23	20 9 24.53	2.0746	16 52 26.8	4.390
24	20 11 28.93	2.0720	S. 16 48 1.1	4.466

SATURDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 11 28.93	2.0720	S. 16 48 1.1	4.466
1	20 13 33.17	2.0693	16 43 30.9	4.541
2	20 15 37.24	2.0665	16 38 56.2	4.615
3	20 17 41.15	2.0638	16 34 17.1	4.689
4	20 19 44.90	2.0612	16 29 33.5	4.762
5	20 21 48.49	2.0586	16 24 45.6	4.835
6	20 23 51.93	2.0559	16 19 53.3	4.907
7	20 25 55.20	2.0532	16 14 56.7	4.979
8	20 27 58.31	2.0505	16 9 55.8	5.051
9	20 30 1.26	2.0478	16 4 50.6	5.122
10	20 32 4.05	2.0452	15 59 41.2	5.192
11	20 34 6.68	2.0425	15 54 27.6	5.261
12	20 36 9.15	2.0398	15 49 9.9	5.330
13	20 38 11.46	2.0372	15 43 48.0	5.399
14	20 40 13.61	2.0345	15 38 22.0	5.467
15	20 42 15.60	2.0318	15 32 52.0	5.534
16	20 44 17.43	2.0292	15 27 17.9	5.601
17	20 46 19.11	2.0266	15 21 39.9	5.667
18	20 48 20.63	2.0240	15 15 57.9	5.733
19	20 50 21.99	2.0213	15 10 11.9	5.799
20	20 52 23.19	2.0187	15 4 22.0	5.863
21	20 54 24.24	2.0162	14 58 28.3	5.927
22	20 56 25.13	2.0136	14 52 30.7	5.991
23	20 58 25.87	2.0111	S. 14 46 29.3	6.054

SUNDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	21 0 26.46	2.0085	S. 14 40 24.2	6.117
1	21 2 26.89	2.0059	14 34 15.3	6.179
2	21 4 27.17	2.0034	14 28 2.7	6.241
3	21 6 27.30	2.0009	14 21 46.4	6.302
4	21 8 27.28	1.9984	14 15 26.5	6.362
5	21 10 27.11	1.9959	14 9 3.0	6.422
6	21 12 26.79	1.9935	14 2 35.9	6.481
7	21 14 26.33	1.9911	13 56 5.3	6.539
8	21 16 25.72	1.9886	13 49 31.2	6.596
9	21 18 24.96	1.9862	13 42 53.5	6.656
10	21 20 24.06	1.9838	13 36 12.4	6.713
11	21 22 23.02	1.9814	13 29 27.9	6.770
12	21 24 21.83	1.9790	13 22 40.0	6.826
13	21 26 20.50	1.9767	13 15 48.8	6.881
14	21 28 19.04	1.9745	13 8 54.3	6.937
15	21 30 17.44	1.9722	13 1 56.4	6.992
16	21 32 15.70	1.9699	12 54 55.3	7.045
17	21 34 13.83	1.9677	12 47 51.0	7.098
18	21 36 11.83	1.9656	12 40 43.5	7.151
19	21 38 9.70	1.9634	12 33 32.9	7.203
20	21 40 7.43	1.9612	12 26 19.2	7.254
21	21 42 5.03	1.9590	12 19 2.4	7.306
22	21 44 2.51	1.9569	12 11 42.5	7.357
23	21 45 59.86	1.9548	12 4 19.5	7.408
24	21 47 57.08	1.9527	S. 11 56 53.5	7.457

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 47 57.08	1.9527	S. 11 56 53.5	7.457
1	21 49 54.18	1.9507	11 49 24.6	7.506
2	21 51 51.17	1.9488	11 41 52.8	7.554
3	21 53 48.04	1.9468	11 34 18.1	7.602
4	21 55 44.79	1.9448	11 26 40.5	7.650
5	21 57 41.42	1.9429	11 19 0.1	7.697
6	21 59 37.94	1.9411	11 11 16.9	7.743
7	22 1 34.35	1.9392	11 3 30.9	7.789
8	22 3 30.65	1.9374	10 55 42.2	7.835
9	22 5 26.84	1.9357	10 47 50.7	7.880
10	22 7 22.93	1.9339	10 39 56.6	7.924
11	22 9 18.91	1.9322	10 31 59.8	7.968
12	22 11 14.79	1.9305	10 24 0.4	8.012
13	22 13 10.57	1.9288	10 15 58.4	8.054
14	22 15 6.25	1.9272	10 7 53.9	8.096
15	22 17 1.84	1.9257	9 59 46.9	8.138
16	22 18 57.34	1.9242	9 51 37.4	8.179
17	22 20 52.75	1.9227	9 43 25.4	8.221
18	22 22 48.07	1.9212	9 35 10.9	8.262
19	22 24 43.30	1.9198	9 26 54.0	8.301
20	22 26 38.45	1.9184	9 18 34.8	8.339
21	22 28 33.51	1.9171	9 10 13.3	8.377
22	22 30 28.50	1.9158	9 1 49.5	8.416
23	22 32 23.41	1.9146	S. 8 53 23.4	8.454

TUESDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 34 18.24	1.9133	S. 8 44 55.0	8.492
1	22 36 13.00	1.9121	8 36 24.4	8.528
2	22 38 7.69	1.9109	8 27 51.7	8.564
3	22 40 2.31	1.9098	8 19 16.8	8.600
4	22 41 56.87	1.9087	8 10 39.7	8.635
5	22 43 51.36	1.9077	8 2 0.6	8.669
6	22 45 45.79	1.9067	7 53 19.4	8.704
7	22 47 40.17	1.9058	7 44 36.1	8.738
8	22 49 34.49	1.9048	7 35 50.8	8.771
9	22 51 28.75	1.9039	7 27 3.6	8.803
10	22 53 22.96	1.9031	7 18 14.5	8.834
11	22 55 17.13	1.9024	7 9 23.5	8.866
12	22 57 11.25	1.9017	7 0 30.6	8.897
13	22 59 5.33	1.9010	6 51 35.8	8.928
14	23 0 59.37	1.9003	6 42 39.2	8.958
15	23 2 53.37	1.8997	6 33 40.8	8.988
16	23 4 47.34	1.8992	6 24 40.6	9.017
17	23 6 41.28	1.8987	6 15 38.7	9.046
18	23 8 35.18	1.8982	6 6 35.1	9.074
19	23 10 29.06	1.8978	5 57 29.8	9.102
20	23 12 22.92	1.8974	5 48 22.9	9.128
21	23 14 16.75	1.8970	5 39 14.4	9.155
22	23 16 10.56	1.8968	5 30 4.3	9.181
23	23 18 4.36	1.8966	5 20 52.7	9.207
24	23 19 58.15	1.8964	S. 5 11 39.5	9.233

WEDNESDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 19 58.15	1.8964	S. 5 11 39.5	9.233
1	23 21 51.93	1.8962	5 2 24.8	9.257
2	23 23 45.70	1.8961	4 53 8.7	9.280
3	23 25 39.46	1.8960	4 43 51.2	9.303
4	23 27 33.22	1.8961	4 34 32.3	9.327
5	23 29 26.99	1.8962	4 25 12.0	9.350
6	23 31 20.76	1.8963	4 15 50.3	9.372
7	23 33 14.54	1.8964	4 6 27.3	9.393
8	23 35 8.33	1.8966	3 57 3.1	9.414
9	23 37 2.13	1.8968	3 47 37.6	9.435
10	23 38 55.95	1.8972	3 38 10.9	9.455
11	23 40 49.79	1.8975	3 28 43.0	9.474
12	23 42 43.65	1.8979	3 19 14.0	9.493
13	23 44 37.54	1.8984	3 9 43.9	9.512
14	23 46 31.46	1.8989	3 0 12.6	9.531
15	23 48 25.41	1.8994	2 50 40.2	9.548
16	23 50 19.39	1.8999	2 41 6.8	9.564
17	23 52 13.40	1.9005	2 31 32.5	9.580
18	23 54 7.45	1.9013	2 21 57.2	9.597
19	23 56 1.55	1.9021	2 12 20.9	9.612
20	23 57 55.70	1.9029	2 2 43.8	9.626
21	23 59 49.90	1.9037	1 53 5.8	9.641
22	0 1 44.15	1.9046	1 43 26.9	9.655
23	0 3 38.46	1.9056	S. 1 33 47.2	9.668

THURSDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 5 32.82	1.9066	S. 1 24 6.8	9.680
1	0 7 27.25	1.9077	1 14 25.6	9.692
2	0 9 21.74	1.9088	1 4 43.7	9.704
3	0 11 16.30	1.9099	0 55 1.1	9.715
4	0 13 10.93	1.9112	0 45 17.9	9.725
5	0 15 5.64	1.9125	0 35 34.1	9.736
6	0 17 0.43	1.9138	0 25 49.6	9.746
7	0 18 55.30	1.9152	0 16 4.6	9.754
8	0 20 50.25	1.9166	S. 0 6 19.1	9.762
9	0 22 45.29	1.9181	N. 0 3 26.8	9.769
10	0 24 40.42	1.9196	0 13 13.2	9.777
11	0 26 35.64	1.9212	0 23 0.0	9.784
12	0 28 30.96	1.9228	0 32 47.3	9.791
13	0 30 26.38	1.9245	0 42 34.9	9.795
14	0 32 21.90	1.9262	0 52 22.7	9.799
15	0 34 17.53	1.9281	1 2 10.8	9.804
16	0 36 13.27	1.9300	1 11 59.2	9.808
17	0 38 9.13	1.9319	1 21 47.8	9.811
18	0 40 5.10	1.9338	1 31 36.5	9.813
19	0 42 1.19	1.9359	1 41 25.4	9.815
20	0 43 57.41	1.9380	1 51 14.3	9.816
21	0 45 53.75	1.9401	2 1 3.3	9.817
22	0 47 50.22	1.9422	2 10 52.3	9.817
23	0 49 46.82	1.9445	2 20 41.3	9.817
24	0 51 43.56	1.9468	N. 2 30 30.3	9.816

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 25.					**SUNDAY 27.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 51 43.56	1.9468	N. 2 30 30.3	9.816	0	2 28 49.53	2.1183	N.10 6 59.1	8.906
1	0 53 40.44	1.9492	2 40 19.2	9.813	1	2 30 56.77	2.1231	10 15 52.3	8.867
2	0 55 37.46	1.9516	2 50 7.9	9.811	2	2 33 4.30	2.1279	10 24 43.1	8.826
3	0 57 34.63	1.9541	2 59 56.5	9.808	3	2 35 12.12	2.1327	10 33 31.4	8.784
4	0 59 31.95	1.9566	3 9 44.9	9.804	4	2 37 20.23	2.1376	10 42 17.2	8.742
5	1 1 29.42	1.9591	3 19 33.0	9.799	5	2 39 28.63	2.1424	10 51 0.5	8.699
6	1 3 27.04	1.9617	3 29 20.8	9.794	6	2 41 37.32	2.1473	10 59 41.1	8.654
7	1 5 24.82	1.9644	3 39 8.3	9.788	7	2 43 46.31	2.1523	11 8 19.0	8.609
8	1 7 22.77	1.9672	3 48 55.4	9.782	8	2 45 55.60	2.1573	11 16 54.2	8.563
9	1 9 20.88	1.9699	3 58 42.1	9.775	9	2 48 5.19	2.1623	11 25 26.6	8.516
10	1 11 19.16	1.9727	4 8 28.4	9.767	10	2 50 15.08	2.1674	11 33 56.1	8.467
11	1 13 17.61	1.9756	4 18 14.2	9.759	11	2 52 25.28	2.1725	11 42 22.7	8.417
12	1 15 16.23	1.9785	4 27 59.5	9.750	12	2 54 35.78	2.1776	11 50 46.2	8.367
13	1 17 15.03	1.9816	4 37 44.2	9.740	13	2 56 46.59	2.1827	11 59 6.7	8.316
14	1 19 14.02	1.9847	4 47 28.3	9.730	14	2 58 57.71	2.1879	12 7 24.1	8.264
15	1 21 13.19	1.9878	4 57 11.8	9.719	15	3 1 9.14	2.1932	12 15 38.4	8.211
16	1 23 12.55	1.9909	5 6 54.6	9.707	16	3 3 20.89	2.1984	12 23 49.4	8.156
17	1 25 12.10	1.9941	5 16 36.6	9.693	17	3 5 32.95	2.2037	12 31 57.1	8.100
18	1 27 11.84	1.9973	5 26 17.8	9.680	18	3 7 45.33	2.2090	12 40 1.4	8.043
19	1 29 11.78	2.0007	5 35 58.2	9.666	19	3 9 58.03	2.2143	12 48 2.3	7.986
20	1 31 11.92	2.0041	5 45 37.7	9.652	20	3 12 11.05	2.2196	12 55 59.7	7.927
21	1 33 12.27	2.0075	5 55 16.4	9.636	21	3 14 24.38	2.2249	13 3 53.5	7.867
22	1 35 12.82	2.0109	6 4 54.1	9.619	22	3 16 38.04	2.2303	13 11 43.7	7.806
23	1 37 13.58	2.0145	N. 6 14 30.7	9.602	23	3 18 52.02	2.2357	N.13 19 30.2	7.743
	SATURDAY 26.					**MONDAY 28.**			
0.	1 39 14.56	2.0181	N. 6 24 6.3	9.584	0	3 21 6.32	2.2411	N.13 27 12.9	7.680
1	1 41 15.74	2.0217	6 33 40.8	9.566	1	3 23 20.95	2.2465	13 34 51.8	7.616
2	1 43 17.16	2.0253	6 43 14.2	9.547	2	3 25 35.90	2.2519	13 42 26.8	7.551
3	1 45 18.79	2.0291	6 52 46.4	9.526	3	3 27 51.18	2.2574	13 49 57.9	7.484
4	1 47 20.65	2.0329	7 2 17.3	9.505	4	3 30 6.79	2.2629	13 57 24.9	7.417
5	1 49 22.74	2.0367	7 11 47.0	9.483	5	3 32 22.73	2.2684	14 4 47.9	7.348
6	1 51 25.05	2.0405	7 21 15.3	9.460	6	3 34 39.00	2.2739	14 12 6.7	7.278
7	1 53 27.60	2.0445	7 30 42.2	9.437	7	3 36 55.60	2.2793	14 19 21.3	7.207
8	1 55 30.39	2.0485	7 40 7.7	9.413	8	3 39 12.52	2.2847	14 26 31.6	7.135
9	1 57 33.42	2.0525	7 49 31.8	9.388	9	3 41 29.77	2.2902	14 33 37.5	7.062
10	1 59 36.69	2.0565	7 58 54.3	9.362	10	3 43 47.35	2.2957	14 40 39.0	6.987
11	2 1 40.20	2.0606	8 8 15.2	9.335	11	3 46 5.26	2.3013	14 47 36.0	6.912
12	2 3 43.96	2.0647	8 17 34.5	9.307	12	3 48 23.51	2.3069	14 54 28.5	6.836
13	2 5 47.97	2.0690	8 26 52.1	9.279	13	3 50 42.09	2.3123	15 1 16.3	6.758
14	2 7 52.24	2.0733	8 36 8.0	9.249	14	3 53 0.99	2.3178	15 7 59.4	6.679
15	2 9 56.77	2.0777	8 45 22.0	9.218	15	3 55 20.22	2.3233	15 14 37.8	6.599
16	2 12 1.56	2.0820	8 54 34.2	9.187	16	3 57 39.79	2.3288	15 21 11.3	6.517
17	2 14 6.61	2.0863	9 3 44.5	9.156	17	3 59 59.68	2.3342	15 27 39.9	6.435
18	2 16 11.92	2.0907	9 12 52.9	9.123	18	4 2 19.90	2.3397	15 34 3.5	6.351
19	2 18 17.50	2.0953	9 21 59.3	9.089	19	4 4 40.45	2.3452	15 40 22.0	6.267
20	2 20 23.36	2.0999	9 31 3.6	9.054	20	4 7 1.33	2.3507	15 46 35.5	6.182
21	2 22 29.49	2.1044	9 40 5.8	9.018	21	4 9 22.53	2.3561	15 52 43.8	6.094
22	2 24 35.89	2.1090	9 49 5.8	8.982	22	4 11 44.06	2.3615	15 58 46.8	6.006
23	2 26 42.57	2.1136	9 58 3.6	8.944	23	4 14 5.91	2.3669	16 4 44.5	5.917
24	2 28 49.53	2.1183	N.10 6 59.1	8.906	24	4 16 28.09	2.3723	N.16 10 36.9	5.827

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 29.			
	h m s	s	° ′ ″	″
0	4 16 28.09	2.3723	N.16 10 36.9	5.827
1	4 18 50.59	2.3776	16 16 23.8	5.736
2	4 21 13.41	2.3829	16 22 5.2	5.643
3	4 23 36.54	2.3882	16 27 41.0	5.549
4	4 25 59.99	2.3935	16 33 11.1	5.455
5	4 28 23.76	2.3988	16 38 35.6	5.360
6	4 30 47.85	2.4041	16 43 54.3	5.263
7	4 33 12.25	2.4092	16 49 7.1	5.164
8	4 35 36.95	2.4143	16 54 14.0	5.066
9	4 38 1.96	2.4193	16 59 15.0	4.966
10	4 40 27.27	2.4244	17 4 9.9	4.864
11	4 42 52.89	2.4295	17 8 58.7	4.762
12	4 45 18.81	2.4345	17 13 41.3	4.658
13	4 47 45.03	2.4394	17 18 17.7	4.554
14	4 50 11.54	2.4442	17 22 47.8	4.449
15	4 52 38.34	2.4491	17 27 11.6	4.343
16	4 55 5.43	2.4539	17 31 29.0	4.236
17	4 57 32.81	2.4587	17 35 39.9	4.127
18	5 0 0.47	2.4633	17 39 44.2	4.017
19	5 2 28.41	2.4680	17 43 41.9	3.907
20	5 4 56.63	2.4726	17 47 33.0	3.796
21	5 7 25.12	2.4771	17 51 17.4	3.683
22	5 9 53.88	2.4815	17 54 55.0	3.570
23	5 12 22.90	2.4858	N.17 58 25.8	3.457
	WEDNESDAY 30.			
0	5 14 52.18	2.4903	N.18 1 49.8	3.342
1	5 17 21.72	2.4944	18 5 6.8	3.225
2	5 19 51.51	2.4986	18 8 16.8	3.108
3	5 22 21.56	2.5026	18 11 19.8	2.991
4	5 24 51.85	2.5066	18 14 15.7	2.872
5	5 27 22.37	2.5107	18 17 4.5	2.753
6	5 29 53.13	2.5146	18 19 46.1	2.633
7	5 32 24.12	2.5184	18 22 20.4	2.512
8	5 34 55,34	2.5222	18 24 47.5	2.391
9	5 37 26.78	2.5258	18 27 7.3	2.268
10	5 39 58.43	2.5293	18 29 19.7	2.145
11	5 42 30.30	2.5328	18 31 24.7	2.022
12	5 45 2.37	2.5362	18 33 22.3	1.897
13	5 47 34.64	2.5395	18 35 12.4	1.772
14	5 50 7.11	2.5427	18 36 54.9	1.646
15	5 52 39.77	2.5458	18 38 29.9	1.520
16	5 55 12.61	2.5489	18 39 57.3	1.392
17	5 57 45.64	2.5519	18 41 17.0	1.264
18	6 0 18.84	2.5547	18 42 29.0	1.136
19	6 2 52.20	2.5574	18 43 33.3	1.007
20	6 5 25.73	2.5601	18 44 29.9	0.879
21	6 7 59.42	2.5627	18 45 18.8	0.750
22	6 10 33.26	2.5652	18 45 59.9	0.620
23	6 13 7.24	2.5675	18 46 33.2	0.489
24	6 15 41.36	2.5697	N.18 46 58.6	0.358

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY, JULY 1.			
	h m s	s	° ′ ″	″
0	6 15 41.36	2.5697	N.18 46 58.6	0.358

PHASES OF THE MOON.

		d	h	m
● New Moon . .	June	2	1	55.3
☽ First Quarter . . .		8	19	26.7
○ Full Moon		16	1	38.8
☾ Last Quarter. . . .		24	4	34.8

		d	h
☾ Perigee. . . .	June	5	10.8
☾ Apogee.		21	4.9

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
4	Sun	W.	25° 59′ 14″	2592	27° 38′ 20″	2580	29° 17′ 43″	2569	30° 57′ 21″	2560
	Regulus	E.	49 4 39	2212	47 16 30	2209	45 28 16	2206	43 39 58	2204
	Mars	E.	68 5 30	2333	66 20 19	2330	64 35 3	2326	62 49 42	2324
	Jupiter	E.	77 3 12	2220	75 15 15	2217	73 27 13	2214	71 39 6	2211
	Spica	E.	102 40 50	2229	100 53 6	2225	99 5 16	2222	97 17 21	2219
5	Sun	W.	39 18 4	2532	40 58 33	2529	42 39 6	2527	44 19 42	2526
	Saturn	W.	15 49 52	2366	17 34 16	2340	19 19 18	2321	21 4 47	2309
	Regulus	E.	34 37 45	2198	32 49 15	2199	31 0 46	2200	29 12 19	2202
	Mars	E.	54 2 16	2317	52 16 42	2318	50 31 9	2319	48 45 37	2320
	Jupiter	E.	62 37 47	2204	60 49 26	2205	59 1 6	2206	57 12 47	2207
	Spica	E.	88 16 59	2212	86 28 50	2212	84 40 41	2212	82 52 32	2213
6	Sun	W.	52 42 51	2527	54 23 26	2530	56 3 58	2533	57 44 26	2535
	Saturn	W.	29 55 27	2281	31 41 54	2281	33 28 22	2281	35 14 50	2281
	Mars	E.	39 58 25	2330	38 13 9	2333	36 27 58	2336	34 42 51	2339
	Jupiter	E.	48 11 38	2216	46 23 34	2219	44 35 34	2222	42 47 39	2226
	Spica	E.	73 52 19	2224	72 4 27	2227	70 16 40	2231	68 28 58	2236
7	Sun	W.	66 5 39	2555	67 45 36	2559	69 25 27	2564	71 5 11	2570
	Saturn	W.	44 6 38	2294	45 52 47	2297	47 38 51	2301	49 24 49	2306
	Pollux	W.	32 4 32	2493	33 45 55	2474	35 27 44	2460	37 9 53	2448
	Jupiter	E.	33 49 34	2247	32 2 17	2253	30 15 8	2258	28 28 7	2264
	Spica	E.	59 32 9	2260	57 45 11	2266	55 58 22	2272	54 11 42	2279
	Antares	E.	105 18 7	2299	103 32 6	2304	101 46 12	2308	100 0 24	2313
8	Sun	W.	79 21 49	2601	81 0 43	2608	82 39 27	2615	84 18 2	2621
	Saturn	W.	58 12 50	2333	59 58 2	2339	61 43 5	2345	63 27 59	2351
	Pollux	W.	45 43 43	2421	47 26 48	2419	49 9 55	2419	50 53 2	2420
	Spica	E.	45 21 3	2319	43 35 31	2328	41 50 12	2337	40 5 7	2348
	Antares	E.	91 13 17	2341	89 28 17	2348	87 43 27	2354	85 58 46	2362
9	Sun	W.	92 28 31	2659	94 6 6	2667	95 43 30	2675	97 20 43	2683
	Saturn	W.	72 10 7	2385	73 54 3	2392	75 37 49	2400	77 21 24	2407
	Pollux	W.	59 28 7	2432	61 10 56	2436	62 53 39	2441	64 36 15	2446
	Regulus	W.	22 44 57	2345	24 29 51	2351	26 14 36	2357	27 59 12	2364
	Antares	E.	77 18 1	2400	75 34 26	2408	73 51 2	2417	72 7 51	2425
10	Sun	W.	105 24 6	2725	107 0 13	2733	108 36 9	2742	110 11 53	2750
	Saturn	W.	85 56 40	2445	87 39 10	2453	89 21 30	2460	91 3 39	2468
	Pollux	W.	73 7 26	2474	74 49 16	2480	76 30 57	2487	78 12 28	2494
	Regulus	W.	36 39 46	2399	38 23 22	2406	40 6 48	2414	41 50 3	2422
	Mars	W.	15 5 14	2533	16 45 41	2541	18 25 57	2549	20 6 2	2558
	Antares	E.	63 35 6	2472	61 53 14	2482	60 11 36	2493	58 30 13	2504
11	Sun	W.	118 7 41	2795	119 42 15	2805	121 16 37	2814	122 50 47	2823
	Saturn	W.	99 31 36	2509	101 12 37	2517	102 53 27	2525	104 34 6	2533
	Pollux	W.	86 37 36	2531	88 18 6	2538	89 58 26	2546	91 38 35	2554
	Regulus	W.	50 23 34	2460	52 5 44	2467	53 47 43	2476	55 29 30	2484
	Mars	W.	28 23 35	2599	30 2 31	2607	31 41 16	2616	33 19 49	2624
	Jupiter	W.	22 3 32	2475	23 45 20	2483	25 26 57	2492	27 8 22	2499
	Antares	E.	50 7 19	2565	48 27 36	2579	46 48 12	2593	45 9 7	2608

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
4	**Sun**	W.	32° 37′ 11″	2552	34° 17′ 12″	2545	35° 57′ 22″	2540	37° 37′ 40″	2535
	Regulus	E.	41 51 36	2202	40 3 11	2200	38 14 44	2199	36 26 15	2198
	Mars	E.	61 4 18	2322	59 18 51	2320	57 33 21	2319	55 47 49	2318
	Jupiter	E.	69 50 55	2209	68 2 41	2208	66 14 25	2206	64 26 7	2205
	Spica	E.	95 29 22	2217	93 41 20	2215	91 53 15	2214	90 5 8	2212
5	**Sun**	W.	46 0 19	2525	47 40 57	2525	49 21 36	2525	51 2 14	2526
	Saturn	W.	22 50 34	2300	24 36 34	2293	26 22 44	2287	28 9 3	2283
	Regulus	E.	27 23 54	2204	25 35 32	2206	23 47 14	2209	21 59 0	2213
	Mars	E.	47 0 6	2321	45 14 37	2322	43 29 10	2324	41 43 46	2326
	Jupiter	E.	55 24 29	2208	53 36 13	2209	51 47 59	2210	49 59 47	2212
	Spica	E.	81 4 24	2214	79 16 18	2216	77 28 15	2218	75 40 15	2221
6	**Sun**	W.	59 24 50	2538	61 5 10	2542	62 45 25	2545	64 25 35	2550
	Saturn	W.	37 1 17	2283	38 47 42	2284	40 34 5	2287	42 20 24	2290
	Mars	E.	32 57 49	2344	31 12 53	2348	29 28 4	2353	27 43 21	2358
	Jupiter	E.	40 59 50	2229	39 12 6	2234	37 24 29	2238	35 36 58	2243
	Spica	E.	66 41 22	2239	64 53 53	2244	63 6 31	2249	61 19 16	2254
7	**Sun**	W.	72 44 47	2576	74 24 15	2582	76 3 35	2588	77 42 46	2594
	Saturn	W.	51 10 40	2311	52 56 24	2315	54 42 1	2321	56 27 30	2327
	Pollux	W.	38 52 19	2439	40 34 58	2433	42 17 46	2427	44 0 42	2424
	Jupiter	E.	26 41 14	2270	24 54 30	2275	23 7 54	2281	21 21 27	2288
	Spica	E.	52 25 12	2287	50 38 53	2294	48 52 45	2302	47 6 48	2310
	Antares	E.	98 14 43	2317	96 29 9	2323	94 43 43	2329	92 58 26	2335
8	**Sun**	W.	85 56 28	2629	87 34 44	2636	89 12 50	2643	90 50 46	2652
	Saturn	W.	65 12 44	2358	66 57 19	2364	68 41 45	2371	70 26 1	2378
	Pollux	W.	52 36 8	2421	54 19 13	2423	56 2 15	2426	57 45 13	2429
	Spica	E.	38 20 17	2359	36 35 43	2370	34 51 25	2382	33 7 24	2395
	Antares	E.	84 14 16	2363	82 29 56	2375	80 45 46	2384	79 1 48	2391
9	**Sun**	W.	98 57 46	2691	100 34 38	2699	102 11 19	2708	103 47 48	2716
	Saturn	W.	79 4 49	2415	80 48 3	2422	82 31 6	2430	84 13 58	2437
	Pollux	W.	66 18 44	2451	68 1 6	2456	69 43 21	2462	71 25 28	2468
	Regulus	W.	29 43 39	2371	31 27 56	2378	33 12 3	2384	34 56 0	2392
	Antares	E.	70 24 52	2433	68 42 5	2443	66 59 32	2453	65 17 12	2462
10	**Sun**	W.	111 47 26	2760	113 22 47	2768	114 57 57	2777	116 32 55	2786
	Saturn	W.	92 45 37	2476	94 27 24	2485	96 8 59	2492	97 50 23	2500
	Pollux	W.	79 53 50	2501	81 35 2	2508	83 16 4	2516	84 56 55	2523
	Regulus	W.	43 33 7	2429	45 16 0	2437	46 58 42	2445	48 41 13	2452
	Mars	W.	21 45 55	2566	23 25 37	2574	25 5 8	2583	26 44 27	2591
	Antares	E.	56 49 6	2516	55 8 15	2527	53 27 40	2539	51 47 21	2551
11	**Sun**	W.	124 24 45	2832	125 58 31	2842	127 32 4	2852	129 5 24	2862
	Saturn	W.	106 14 33	2542	107 54 48	2550	109 34 52	2559	111 14 44	2566
	Pollux	W.	93 18 33	2563	94 58 19	2571	96 37 54	2580	98 17 17	2589
	Regulus	W.	57 11 6	2492	58 52 31	2499	60 33 45	2507	62 14 48	2516
	Mars	W.	34 58 11	2633	36 36 21	2641	38 14 20	2650	39 52 7	2658
	Jupiter	W.	28 49 36	2508	30 30 38	2516	32 11 29	2524	33 52 9	2533
	Antares	E.	43 30 23	2624	41 52 1	2642	40 14 3	2660	38 36 30	2680

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
12	**Sun**	W.	130° 38′ 32″	2872	132° 11′ 27″	2882	133° 44′ 9″	2893	135° 16′ 37″	2903
	Regulus	W.	63 55 39	2524	65 36 19	2532	67 16 48	2540	68 57 5	2548
	Mars	W.	41 29 43	2667	43 7 7	2676	44 44 19	2684	46 21 20	2693
	Jupiter	W.	35 32 37	2540	37 12 54	2549	38 52 59	2558	40 32 52	2566
	Antares	E.	36 59 23	2701	35 22 45	2725	33 46 39	2751	32 11 7	2781
	α Aquilæ	E.	86 22 4	2986	84 51 34	2997	83 21 18	3009	81 51 16	3021
13	Regulus	W.	77 15 41	2590	78 54 50	2599	80 33 47	2607	82 12 32	2615
	Mars	W.	54 23 27	2738	55 59 17	2747	57 34 55	2756	59 10 21	2764
	Jupiter	W.	48 49 24	2609	50 28 7	2618	52 6 38	2626	53 44 58	2635
	Spica	W.	24 8 43	2698	25 45 25	2694	27 22 13	2692	28 59 3	2692
	α Aquilæ	E.	74 25 14	3095	72 56 58	3113	71 29 4	3132	70 1 33	3152
	Fomalhaut	E.	107 15 25	2941	105 43 58	2943	104 12 34	2947	102 41 15	2951
14	Regulus	W.	90 23 22	2660	92 0 56	2668	93 38 19	2677	95 15 30	2686
	Mars	W.	67 4 32	2811	68 38 45	2820	70 12 47	2829	71 46 37	2839
	Jupiter	W.	61 53 38	2679	63 30 46	2688	65 7 42	2697	66 44 26	2707
	Spica	W.	37 2 40	2709	38 39 8	2714	40 15 29	2720	41 51 42	2726
	α Aquilæ	E.	62 50 22	3270	61 25 35	3298	60 1 21	3328	58 37 42	3359
	Fomalhaut	E.	95 6 13	2981	93 35 37	2989	92 5 10	2997	90 34 54	3005
15	**Mars**	W.	79 32 41	2887	81 5 16	2897	82 37 39	2906	84 9 50	2916
	Jupiter	W.	74 45 1	2753	76 20 31	2762	77 55 49	2771	79 30 55	2780
	Spica	W.	49 50 36	2762	51 25 54	2770	53 1 1	2778	54 35 58	2785
	α Aquilæ	E.	51 49 24	3556	50 30 2	3605	49 11 33	3657	47 54 0	3713
	Fomalhaut	E.	83 6 25	3057	81 37 23	3069	80 8 35	3081	78 40 2	3093
16	**Jupiter**	W.	87 23 22	2827	88 57 15	2837	90 30 55	2846	92 4 23	2855
	Spica	W.	62 28 4	2828	64 1 56	2836	65 35 37	2844	67 9 8	2852
	Fomalhaut	E.	71 21 23	3167	69 54 34	3183	68 28 4	3200	67 1 55	3218
	α Pegasi	E.	86 1 58	3085	84 33 30	3096	83 5 15	3107	81 37 14	3118
17	**Jupiter**	W.	99 48 48	2901	101 21 6	2909	102 53 13	2919	104 25 8	2927
	Spica	W.	74 53 53	2897	76 26 16	2905	77 58 29	2913	79 30 31	2922
	Antares	W.	30 6 41	3118	31 34 29	3106	33 2 31	3097	34 30 44	3091
	Fomalhaut	E.	59 56 47	3320	58 32 59	3345	57 9 39	3370	55 46 48	3396
	α Pegasi	E.	74 20 44	3182	72 54 13	3196	71 27 59	3210	70 2 2	3225
18	Spica	W.	87 8 3	2963	88 39 2	2970	90 9 52	2978	91 40 32	2986
	Antares	W.	41 53 13	3078	43 21 49	3079	44 50 24	3081	46 18 57	3082
	Fomalhaut	E.	49 0 35	3554	47 41 10	3591	46 22 26	3633	45 4 27	3677
	α Pegasi	E.	62 56 55	3309	61 32 54	3327	60 9 14	3346	58 45 56	3366
19	Antares	W.	53 41 7	3095	55 9 23	3098	56 37 35	3101	58 5 44	3104
	Fomalhaut	E.	38 47 32	3962	37 35 15	4036	36 24 11	4119	35 14 28	4211
	α Pegasi	E.	51 55 38	3485	50 34 57	3513	49 14 47	3542	47 55 9	3574
	α Arietis	E.	94 5 25	3135	92 37 58	3142	91 10 39	3148	89 43 27	3153
	Venus	E.	106 27 57	3437	105 6 22	3444	103 44 55	3451	102 23 36	3458
20	Antares	W.	65 25 33	3119	66 53 20	3120	68 21 5	3123	69 48 47	3125
	α Arietis	E.	82 29 11	3182	81 2 40	3187	79 36 15	3192	78 9 56	3198
	Venus	E.	95 38 47	3486	94 18 7	3490	92 57 32	3495	91 37 2	3499

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
12	**Sun**	W.	136° 48′ 52″	2914	138° 20′ 53″	2925	139° 52′ 40″	2937	141° 24′ 12″	2948
	Regulus	W.	70 37 11	2556	72 17 6	2565	73 56 49	2573	75 36 21	2582
	Mars	W.	47 58 9	2702	49 34 46	2711	51 11 11	2719	52 47 25	2728
	Jupiter	W.	42 12 34	2574	43 52 4	2583	45 31 22	2591	47 10 29	2600
	Antares	E.	30 36 14	2813	29 2 3	2849	27 28 39	2892	25 56 10	2942
	α Aquilæ	E.	80 21 29	3034	78 51 58	3048	77 22 45	3063	75 53 50	3078
13	Regulus	W.	83 51 6	2624	85 29 28	2633	87 7 38	2642	88 45 36	2651
	Mars	W.	60 45 36	2773	62 20 39	2783	63 55 29	2792	65 30 7	2802
	Jupiter	W.	55 23 6	2643	57 1 2	2652	58 38 46	2661	60 16 18	2670
	Spica	W.	30 35 53	2694	32 12 41	2696	33 49 26	2700	35 26 6	2704
	α Aquilæ	E.	68 34 26	3173	67 7 44	3194	65 41 28	3218	64 15 40	3243
	Fomalhaut	E.	101 10 1	2956	99 38 53	2962	98 7 52	2967	96 36 58	2974
14	Regulus	W.	96 52 29	2695	98 29 16	2704	100 5 51	2713	101 42 13	2722
	Mars	W.	73 20 14	2848	74 53 39	2858	76 26 52	2867	77 59 53	2877
	Jupiter	W.	68 20 57	2716	69 57 16	2725	71 33 23	2734	73 9 18	2743
	Spica	W.	43 27 47	2733	45 3 43	2740	46 39 30	2747	48 15 8	2754
	α Aquilæ	E.	57 14 39	3394	55 52 16	3431	54 30 34	3470	53 9 36	3511
	Fomalhaut	E.	89 4 48	3015	87 34 54	3025	86 5 12	3034	84 35 42	3045
15	**Mars**	W.	85 41 49	2925	87 13 36	2935	88 45 10	2945	90 16 32	2954
	Jupiter	W.	81 5 49	2789	82 40 31	2799	84 15 0	2808	85 49 17	2818
	Spica	W.	56 10 45	2794	57 45 21	2802	59 19 46	2811	60 54 0	2818
	α Aquilæ	E.	46 37 27	3775	45 21 59	3841	44 7 39	3914	42 54 33	3992
	Fomalhaut	E.	77 11 44	3106	75 43 42	3121	74 15 58	3135	72 48 31	3151
16	**Jupiter**	W.	93 37 40	2864	95 10 45	2873	96 43 38	2883	98 16 19	2892
	Spica	W.	68 42 28	2862	70 15 36	2870	71 48 33	2879	73 21 19	2888
	Fomalhaut	E.	65 36 7	3236	64 10 41	3257	62 45 39	3277	61 21 1	3298
	α Pegasi	E.	80 9 26	3129	78 41 52	3143	77 14 34	3155	75 47 31	3168
17	**Jupiter**	W.	105 56 52	2936	107 28 25	2945	108 59 47	2954	110 30 58	2962
	Spica	W.	81 2 22	2930	82 34 3	2939	84 5 33	2946	85 36 53	2954
	Antares	W.	35 59 5	3086	37 27 32	3082	38 56 4	3080	40 24 38	3079
	Fomalhaut	E.	54 24 27	3423	53 2 37	3453	51 41 20	3485	50 20 39	3518
	α Pegasi	E.	68 36 23	3241	67 11 2	3257	65 46 0	3273	64 21 17	3291
18	Spica	W.	93 11 2	2993	94 41 23	3001	96 11 35	3008	97 41 38	3014
	Antares	W.	47 47 28	3084	49 15 57	3086	50 44 24	3089	52 12 47	3091
	Fomalhaut	E.	43 47 15	3724	42 30 53	3776	41 15 26	3832	40 0 57	3895
	α Pegasi	E.	57 23 1	3388	56 0 31	3410	54 38 26	3434	53 16 48	3459
19	Antares	W.	59 33 49	3106	61 1 51	3110	62 29 49	3113	63 57 43	3116
	Fomalhaut	E.	34 6 12	4314	32 59 32	4428	31 54 36	4557	30 51 34	4703
	α Pegasi	E.	46 36 6	3607	45 17 39	3643	43 59 51	3683	42 42 46	3727
	α Arietis	E.	88 16 22	3159	86 49 24	3165	85 22 33	3171	83 55 49	3176
	Venus	E.	101 2 25	3464	99 41 21	3470	98 20 23	3476	96 59 32	3481
20	Antares	W.	71 16 26	3127	72 44 3	3129	74 11 38	3130	75 39 11	3132
	α Arietis	E.	76 43 44	3202	75 17 37	3206	73 51 35	3211	72 25 39	3215
	Venus	E.	90 16 37	3502	88 56 15	3506	87 35 57	3508	86 15 42	3511

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
20	Sun	E.	135° 40′ 4″	3439	134° 18′ 32″	3443	132° 57′ 4″	3446	131° 35′ 39″	3447
21	Antares	W.	77 6 42	3133	78 34 12	3133	80 1 42	3133	81 29 11	3133
	α Aquilæ	W.	36 45 15	4683	37 46 29	4578	38 49 13	4483	39 53 20	4397
	α Arietis	E.	70 59 48	3220	69 34 2	3225	68 8 22	3229	66 42 47	3232
	Venus	E.	84 55 30	3513	83 35 20	3515	82 15 12	3515	80 55 5	3515
	Aldebaran	E.	103 6 45	3067	101 37 55	3069	100 9 7	3070	98 40 21	3071
	Sun	E.	124 49 8	3456	123 27 55	3456	122 6 42	3457	120 45 30	3457
22	Antares	W.	88 46 46	3199	90 14 21	3196	91 41 59	3124	93 9 40	3121
	α Aquilæ	W.	45 31 17	4071	46 41 47	4020	47 53 7	3973	49 5 13	3930
	α Arietis	E.	59 36 0	3253	58 10 53	3256	56 45 50	3260	55 20 52	3265
	Venus	E.	74 14 30	3513	72 54 20	3511	71 34 8	3508	70 13 53	3505
	Aldebaran	E.	91 16 29	3067	89 47 39	3065	88 18 46	3062	86 49 50	3059
	Sun	E.	113 59 18	3450	112 37 58	3447	111 16 35	3445	109 55 9	3441
23	α Aquilæ	W.	55 15 44	3752	56 31 36	3722	57 48 0	3693	59 4 54	3665
	α Arietis	E.	48 17 24	3291	46 53 2	3298	45 28 48	3306	44 4 44	3315
	Venus	E.	63 31 35	3482	62 10 51	3477	60 50 1	3470	59 29 3	3463
	Aldebaran	E.	79 24 3	3038	77 54 37	3032	76 25 4	3026	74 55 23	3019
	Sun	E.	103 6 47	3416	101 44 49	3409	100 22 43	3403	99 0 30	3395
24	α Aquilæ	W.	65 36 22	3545	66 55 57	3523	68 15 56	3501	69 36 19	3481
	Fomalhaut	W.	33 46 3	4197	34 54 32	4098	36 4 36	4008	37 16 8	3927
	Venus	E.	52 42 7	3421	51 20 14	3411	49 58 10	3400	48 35 54	3390
	Aldebaran	E.	67 24 44	2979	65 54 5	2970	64 23 15	2961	62 52 13	2950
	Sun	E.	92 7 6	3351	90 43 54	3341	89 20 30	3331	87 56 54	3320
25	α Aquilæ	W.	76 23 50	3384	77 46 25	3365	79 9 22	3347	80 32 39	3329
	Fomalhaut	W.	43 32 17	3609	44 50 42	3558	46 10 2	3511	47 30 14	3466
	α Pegasi	W.	30 17 38	4241	31 25 25	4113	32 35 14	3999	33 46 55	3897
	Venus	E.	41 41 22	3331	40 17 46	3317	38 53 54	3303	37 29 46	3289
	Aldebaran	E.	55 13 35	2893	53 41 7	2880	52 8 22	2867	50 35 21	2853
	Sun	E.	80 55 32	3257	79 30 30	3243	78 5 12	3230	76 39 38	3216
26	Fomalhaut	W.	54 23 2	3274	55 47 44	3240	57 13 6	3208	58 39 6	3176
	α Pegasi	W.	40 8 32	3509	41 28 46	3450	42 50 6	3394	44 12 29	3342
	Venus	E.	30 25 1	3218	28 59 13	3203	27 33 7	3188	26 6 44	3174
	Aldebaran	E.	42 45 45	2782	41 10 53	2766	39 35 40	2750	38 0 7	2734
	Sun	E.	69 27 24	3138	68 0 0	3122	66 32 17	3105	65 4 13	3088
27	Fomalhaut	W.	65 58 9	3034	67 27 40	3008	68 57 43	2982	70 28 18	2958
	α Pegasi	W.	51 18 21	3124	52 46 1	3087	54 14 26	3052	55 43 35	3018
	Sun	E.	57 38 39	3001	56 8 27	2982	54 37 52	2965	53 6 55	2947
28	Fomalhaut	W.	78 8 47	2842	79 42 20	2821	81 16 20	2801	82 50 46	2782
	α Pegasi	W.	63 19 25	2866	64 52 27	2838	66 26 5	2812	68 0 17	2787
	Sun	E.	45 26 31	2857	43 53 17	2840	42 19 41	2823	40 45 43	2806
29	Fomalhaut	W.	90 49 13	2692	92 26 4	2676	94 3 16	2662	95 40 47	2648
	α Pegasi	W.	75 59 13	2673	77 36 29	2652	79 14 13	2633	80 52 23	2615
	Sun	E.	32 50 34	2729	31 14 33	2716	29 38 14	2704	28 1 39	2692

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
20	Sun	E.	130° 14′ 16″	3450	128° 52′ 56″	3452	127° 31′ 38″	3454	126° 10′ 22″	3455
21	Antares	W.	82 56 41	3133	84 24 11	3133	85 51 41	3131	87 19 13	3130
	α Aquilæ	W.	40 58 44	4320	42 5 18	4249	43 12 58	4184	44 21 39	4195
	α Arietis	E.	65 17 16	3936	63 51 50	3941	62 26 29	3944	61 1 12	3948
	Venus	E.	79 34 58	3516	78 14 52	3515	76 54 45	3515	75 34 38	3515
	Aldebaran	E.	97 11 36	3070	95 42 50	3070	94 14 4	3069	92 45 17	3069
	Sun	E.	119 24 18	3456	118 3 5	3455	116 41 51	3454	115 20 35	3453
22	Antares	W.	94 37 24	3118	96 5 12	3114	97 33 4	3110	99 1 1	3106
	α Aquilæ	W.	50 18 2	3890	51 31 32	3853	52 45 40	3817	54 0 25	3784
	α Arietis	E.	53 55 59	3269	52 31 11	3274	51 6 29	3279	49 41 53	3285
	Venus	E.	68 53·34	3502	67 33 12	3497	66 12 45	3493	64 52 13	3488
	Aldebaran	E.	85 20 50	3056	83 51 46	3052	82 22 37	3047	80 53 23	3043
	Sun	E.	108 33 39	3437	107 12 4	3432	105 50 24	3428	104 28 39	3422
23	α Aquilæ	W.	60 22 18	3639	61 40 10	3615	62 58 28	3591	64 17 12	3567
	α Arietis	E.	42 40 50	3325	41 17 8	3337	39 53 39	3351	38 30 26	3366
	Venus	E.	58 7 58	3456	56 46 44	3447	55 25 21	3439	54 3 49	3431
	Aldebaran	E.	73 25 34	3012	71 55 36	3005	70 25 29	2997	68 55 12	2988
	Sun	E.	97 38 8	3387	96 15 37	3379	94 52 57	3371	93 30 7	3361
24	α Aquilæ	W.	70 57 4	3461	72 18 12	3440	73 39 43	3421	75 1 36	3402
	Fomalhaut	W.	38 29 0	3853	39 43 8	3785	40 58 26	3722	42 14 50	3663
	Venus	E.	47 13 26	3379	45 50 46	3367	44 27 52	3355	43 4 44	3343
	Aldebaran	E.	61 20 57	2939	59 49 27	2928	58 17 44	2917	56 45 47	2905
	Sun	E.	86 33 6	3308	85 9 4	3296	83 44 48	3284	82 20 18	3270
25	α Aquilæ	W.	81 56 17	3312	83 20 15	3294	84 44 33	3278	86 9 10	3261
	Fomalhaut	W.	48 51 16	3423	50 13 6	3384	51 35 41	3345	52 59 0	3308
	α Pegasi	W.	35 0 18	3804	36 15 16	3720	37 31 42	3644	38 49 29	3574
	Venus	E.	36 5 22	3276	34 40 42	3261	33 15 45	3247	31 50 31	3233
	Aldebaran	E.	49 2 2	2839	47 28 25	2825	45 54 30	2811	44 20 17	2797
	Sun	E.	75 13 48	3201	73 47 40	3185	72 21 13	3170	70 54 28	3154
26	Fomalhaut	W.	60 5 44	3146	61 32 58	3117	63 0 47	3088	64 29 11	3060
	α Pegasi	W.	45 35 52	3294	47 0 11	3247	48 25 24	3204	49 51 28	3163
	Venus	E.	24 40 4	3160	23 13 7	3146	21 45 53	3133	20 18 24	3122
	Aldebaran	E.	36 24 12	2718	34 47 56	2701	33 11 18	2685	31 34 18	2669
	Sun	E.	63 35 49	3071	62 7 4	3053	60 37 57	3036	59 8 29	3018
27	Fomalhaut	W.	71 59 24	2934	73 31 0	2910	75 3 6	2887	76 35 42	2864
	α Pegasi	W.	57 13 26	2985	58 43 58	2953	60 15 10	2924	61 46 59	2894
	Sun	E.	51 35 36	2929	50 3 54	2911	48 31 49	2892	46 59 21	2876
28	Fomalhaut	W.	84 25 38	2762	86 0 56	2744	87 36 38	2726	89 12 44	2708
	α Pegasi	W.	69 35 2	2763	71 10 19	2739	72 46 7	2716	74 22 25	2694
	Sun	E.	39 11 23	2790	37 36 42	2774	36 1 40	2758	34 26 17	2743
29	Fomalhaut	W.	97 18 37	2635	98 56 45	2622	100 35 10	2611	102 13 50	2601
	α Pegasi	W.	82 30 58	2596	84 9 58	2580	85 49 21	2564	87 29 6	2548
	Sun	E.	26 24 49	2683	24 47 46	2675	23 10 33	2671	21 33 14	2670

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	6 41 24.15	10.344	N. 23 6 36.0	–10.22	15 46.15	68.78	3 32.58	0.487
Frid.	2	6 45 32.28	10.332	23 2 18.4	11.23	15 46.14	68.74	3 44.12	0.475
Sat.	3	6 49 40.12	10.320	22 57 36.7	12.23	15 46.14	68.70	3 55.38	0.463
SUN.	4	6 53 47.65	10.307	22 52 31.0	–13.23	15 46.15	68.66	4 6.32	0.450
Mon.	5	6 57 54.87	10.293	22 47 1.4	14.22	15 46.16	68.62	4 16.95	0.436
Tues.	6	7 2 1.73	10.278	22 41 8.1	15.21	15 46.18	68.57	4 27.22	0.421
Wed.	7	7 6 8.22	10.262	22 34 51.1	–16.19	15 46.20	68.52	4 37.13	0.405
Thur.	8	7 10 14.30	10.245	22 28 10.7	17.16	15 46.23	68.47	4 46.63	0.388
Frid.	9	7 14 19.96	10.227	22 21 7.0	18.13	15 46.26	68.41	4 55.70	0.370
Sat.	10	7 18 25.19	10.209	22 13 40.2	–19.09	15 46.30	68.35	5 4.35	0.352
SUN.	11	7 22 29.98	10.190	22 5 50.5	20.04	15 46.34	68.29	5 12.57	0.333
Mon.	12	7 26 34.31	10.170	21 57 38.0	20.98	15 46.38	68.23	5 20.32	0.313
Tues.	13	7 30 38.16	10.150	21 49 2.8	–21.92	15 46.43	68.16	5 27.59	0.293
Wed.	14	7 34 41.53	10.130	21 40 5.3	22.85	15 46.48	68.09	5 34.38	0.273
Thur.	15	7 38 44.40	10.109	21 30 45.6	23.77	15 46.54	68.02	5 40.67	0.252
Frid.	16	7 42 46.76	10.088	21 21 4.0	–24.68	15 46.60	67.95	5 46.46	0.231
Sat.	17	7 46 48.60	10.066	21 11 0.5	25.58	15 46.66	67.87	5 51.74	0.209
SUN.	18	7 50 49.92	10.043	21 0 35.5	26.47	15 46.72	67.80	5 56.50	0.187
Mon.	19	7 54 50.72	10.021	20 49 49.1	–27.36	15 46.79	67.72	6 0.72	0.165
Tues.	20	7 58 50.98	9.999	20 38 41.7	28.23	15 46.86	67.64	6 4.41	0.143
Wed.	21	8 2 50.70	9.976	20 27 13.5	29.10	15 46.94	67.56	6 7.57	0.120
Thur.	22	8 6 49.88	9.953	20 15 24.6	–29.95	15 47.02	67.48	6 10.18	0.097
Frid.	23	8 10 48.49	9.930	20 3 15.3	30.80	15 47.10	67.40	6 12.23	0.074
Sat.	24	8 14 46.53	9.907	19 50 45.8	31.64	15 47.19	67.32	6 13.73	0.051
SUN.	25	8 18 44.02	9.884	19 37 56.4	–32.46	15 47.28	67.23	6 14.66	0.028
Mon.	26	8 22 40.94	9.860	19 24 47.4	33.27	15 47.37	67.15	6 15.02	0.004
Tues.	27	8 26 37.27	9.836	19 11 19.1	34.07	15 47.47	67.06	6 14.80	0.020
Wed.	28	8 30 33.02	9.811	18 57 31.8	–34.86	15 47.58	66.98	6 14.00	0.045
Thur.	29	8 34 28.18	9.786	18 43 25.7	35.64	15 47.69	66.89	6 12.61	0.070
Frid.	30	8 38 22.74	9.761	18 29 1.1	36.41	15 47.80	66.81	6 10.62	0.095
Sat.	31	8 42 16.70	9.736	18 14 18.3	37.16	15 47.92	66.72	6 8.02	0.120
SUN.	32	8 46 10.05	9.711	N. 17 59 17.5	–37.90	15 48.05	66.64	6 4.83	0.145

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^s.19$ from the sidereal time.
The sign – prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	6 41 23.54	10.343	N. 23 6 36.6	−10.22	3 32.55	0.487	6 37 50.99
Frid.	2	6 45 31.64	10.331	23 2 19.1	11.23	3 44.09	0.475	6 41 47.55
Sat.	3	6 49 39.45	10.319	22 57 37.5	12.23	3 55.35	0.463	6 45 44.10
SUN.	4	6 53 46.95	10.306	22 52 31.9	−13.23	4 6.29	0.450	6 49 40.66
Mon.	5	6 57 54.14	10.292	22 47 2.4	14.22	4 16.92	0.436	6 53 37.22
Tues.	6	7 2 0.97	10.277	22 41 9.2	15.21	4 27.19	0.421	6 57 33.78
Wed.	7	7 6 7.43	10.261	22 34 52.4	−16.19	4 37.10	0.405	7 1 30.33
Thur.	8	7 10 13.49	10.244	22 28 12.1	17.16	4 46.60	0.388	7 5 26.89
Frid.	9	7 14 19.12	10.226	22 21 8.5	18.13	4 55.67	0.370	7 9 23.45
Sat.	10	7 18 24.33	10.208	22 13 41.9	−19.09	5 4.32	0.352	7 13 20.01
SUN.	11	7 22 29.10	10.189	22 5 52.3	20.04	5 12.54	0.333	7 17 16.56
Mon.	12	7 26 33.41	10.169	21 57 39.9	20.98	5 20.29	0.313	7 21 13.12
Tues.	13	7 30 37.24	10.149	21 49 4.9	−21.92	5 27.56	0.293	7 25 9.68
Wed.	14	7 34 40.59	10.129	21 40 7.5	22.85	5 34.35	0.273	7 29 6.24
Thur.	15	7 38 43.44	10.108	21 30 47.9	23.77	5 40.65	0.252	7 33 2.79
Frid.	16	7 42 45.79	10.087	21 21 6.4	−24.68	5 46.44	0.231	7 36 59.35
Sat.	17	7 46 47.62	10.065	21 11 3.1	25.58	5 51.72	0.209	7 40 55.90
SUN.	18	7 50 48.93	10.043	21 0 38.2	26.47	5 56.48	0.187	7 44 52.46
Mon.	19	7 54 49.72	10.021	20 49 51.9	−27.36	6 0.71	0.165	7 48 49.01
Tues.	20	7 58 49.97	9.999	20 38 44.6	28.23	6 4.40	0.143	7 52 45.57
Wed.	21	8 2 49.68	9.976	20 27 16.5	29.10	6 7.56	0.120	7 56 42.12
Thur.	22	8 6 48.85	9.953	20 15 27.7	−29.95	6 10.17	0.097	8 0 38.68
Frid.	23	8 10 47.46	9.930	20 3 18.5	30.80	6 12.23	0.074	8 4 35.23
Sat.	24	8 14 45.50	9.907	19 50 49.1	31.64	6 13.71	0.051	8 8 31.79
SUN.	25	8 18 42.99	9.884	19 37 59.8	−32.46	6 14.65	0.028	8 12 28.34
Mon.	26	8 22 39.91	9.860	19 24 50.9	33.27	6 15.01	0.004	8 16 24.90
Tues.	27	8 26 36.25	9.836	19 11 22.7	34.07	6 14.80	0.020	8 20 21.45
Wed.	28	8 30 32.01	9.811	18 57 35.5	−34.86	6 14.00	0.045	8 24 18.01
Thur.	29	8 34 27.18	9.786	18 43 29.4	35.64	6 12.61	0.070	8 28 14.56
Frid.	30	8 38 21.74	9.761	18 29 4.8	36.41	6 10.62	0.095	8 32 11.12
Sat.	31	8 42 15.71	9.736	18 14 22.1	37.16	6 8.03	0.120	8 36 7.68
SUN.	32	8 46 9.07	9.711	N. 17 59 21.4	−37.90	6 4.84	0.145	8 40 4.23

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour, + 9s.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
1	182	99° 30′ 54″.8	30′ 35″.5	143″.05	− 0″.52	0.0072191	+ 1.3	17h 19m 18s.27
2	183	100 28 8.1	27 48.6	143.05	0.43	0.0072209	+ 0.2	17 15 22.37
3	184	101 25 21.3	25 1.6	143.05	0.33	0.0072201	− 0.9	17 11 26.46
4	185	102 22 34.4	22 14.5	143.05	− 0.21	0.0072166	− 2.0	17 7 30.55
5	186	103 19 47.5	19 27.5	143.04	− 0.07	0.0072106	3.0	17 3 34.64
6	187	104 17 0.5	16 40.4	143.04	+ 0.08	0.0072021	4.0	16 59 38.72
7	188	105 14 13.4	13 53.1	143.03	+ 0.22	0.0071913	− 5.0	16 55 42.81
8	189	106 11 26.2	11 5.7	143.03	0.35	0.0071782	5.9	16 51 46.90
9	190	107 8 38.8	8 18.1	143.02	0.46	0.0071630	6.8	16 47 50.99
10	191	108 5 51.3	5 30.5	143.02	+ 0.56	0.0071458	− 7.6	16 43 55.08
11	192	109 3 3.7	2 42.8	143.01	0.63	0.0071268	8.3	16 39 59.17
12	193	109 60 16.2	59 55.1	143.02	0.66	0.0071061	9.0	16 36 3.26
13	194	110 57 28.9	57 7.6	143.03	+ 0.65	0.0070839	− 9.6	16 32 7.35
14	195	111 54 41.7	54 20.2	143.03	0.61	0.0070600	10.3	16 28 11.43
15	196	112 51 54.8	51 33.2	143.04	0.55	0.0070346	10.9	16 24 15.52
16	197	113 49 8.2	48 46.5	143.06	+ 0.47	0 0070079	− 11.5	16 20 19.61
17	198	114 46 22.1	46 0.2	143.08	0.38	0.0069798	12.0	16 16 23.70
18	199	115 43 36.5	43 14.4	143.11	0.27	0.0069503	12.6	16 12 27.79
19	200	116 40 51.5	40 29.2	143.14	+ 0.14	0.0069194	− 13.2	16 8 31.87
20	201	117 38 7.2	37 44.8	143.17	0.00	0.0068869	13.8	16 4 35.96
21	202	118 35 23.6	35 1.2	143.20	− 0.12	0.0068529	14.5	16 0 40.06
22	203	119 32 40.9	32 18.3	143.24	− 0.23	0.0068173	− 15.2	15 56 44.16
23	204	120 29 59.1	29 36.3	143.28	0.32	0.0067800	16.0	15 52 48.25
24	205	121 27 18.2	26 55.3	143.32	0.39	0.0067407	16.8	15 48 52.34
25	206	122 24 38.3	24 15.2	143.36	− 0.43	0.0066994	− 17.7	15 44 56.43
26	207	123 21 59.4	21 36.2	143.40	0.44	0.0066559	18.6	15 41 0.52
27	208	124 19 21.5	18 58.2	143.44	0.42	0.0066101	19.6	15 37 4.61
28	209	125 16 44.5	16 21.0	143.48	− 0.37	0.0065619	− 20.5	15 33 8.70
29	210	126 14 8.5	13 44.8	143.52	0.30	0.0065114	21.5	15 29 12.79
30	211	127 11 33.4	11 9.6	143.56	0.20	0.0064585	22.6	15 25 16.89
31	212	128 8 59.2	8 35.3	143.59	− 0.08	0.0064031	23.6	15 21 20.98
32	213	129 6 25.9	6 1.9	143.63	+ 0.05	0.0063453	− 24.6	15 17 25.07

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0d.0.

Diff. for 1 Hour,
— 9s.8296.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 22.5	16 26.7	59 59.3	+1.39	60 14.4	+1.11	☌		28.9
2	16 29.8	16 31.9	60 25.9	0.80	60 33.6	+0.47	0 37.5	2.53	0.6
3	16 32.9	16 32.8	60 37.2	+0.14	60 36.9	−0.18	1 37.8	2.49	1.6
4	16 31.7	16 29.6	60 32.8	−0.49	60 25.2	−0.77	2 36.6	2.40	2.6
5	16 26.7	16 23.0	60 14.5	1.01	60 1.0	1.22	2 32.8	2.29	3.6
6	16 18.7	16 13.9	59 45.2	1.39	59 27.7	1.51	4 26.6	2.19	4.6
7	16 8.8	16 3.5	59 8.9	−1.61	58 49.2	−1.66	5 18.4	2.12	5.6
8	15 58.0	15 52.5	58 29.0	1.68	58 8.8	1.68	6 8.8	2.08	6.6
9	15 47.0	15 41.6	57 48.7	1.66	57 28.9	1.62	6 58.4	2.06	7.6
10	15 36.4	15 31.4	57 9.7	−1.57	56 51.3	−1.51	7 48.0	2.07	8.6
11	15 26.6	15 22.0	56 33.7	1.44	56 16.9	1.37	8 37.9	2.08	9.6
12	15 17.6	15 13.5	56 0.9	1.29	55 45.8	1.22	9 28.0	2.09	10.6
13	15 9.7	15 6.0	55 31.6	−1.15	55 18.3	−1.07	10 18.2	2.09	11.6
14	15 2.7	14 59.5	55 5.9	1.00	54 54.4	0.92	11 8.0	2.06	12.6
15	14 56.7	14 54.1	54 43.9	0.83	54 34.4	0.75	11 56.9	2.01	13.6
16	14 51.8	14 49.8	54 25.9	−0.66	54 18.6	−0.56	12 44.6	1.95	14.6
17	14 48.1	14 46.8	54 12.5	0.45	54 7.7	0.34	13 30.7	1.89	15.6
18	14 45.9	14 45.4	54 4.3	−0.22	54 2.5	−0.08	14 15.3	1.83	16.6
19	14 45.4	14 45.8	54 2.4	+0.06	54 4.0	+0.22	14 58.7	1.79	17.6
20	14 46.8	14 48.3	54 7.6	0.38	54 13.2	0.55	15 41.3	1.77	18.6
21	14 50.4	14 53.1	54 20.9	0.73	54 30.8	0.93	16 23.9	1.78	19.6
22	14 56.5	15 0.4	54 43.1	+1.12	54 57.7	+1.31	17 7.2	1.83	20.6
23	15 5.0	15 10.2	55 14.5	1.50	55 33.6	1.68	17 51.8	1.90	21.6
24	15 16.0	15 22.3	55 54.9	1.85	56 18.2	2.02	18 38.8	2.02	22.6
25	15 29.2	15 36.4	56 43.3	+2.16	57 9 9	+2.26	19 28.7	2.15	23.6
26	15 44.0	15 51.7	57 37.6	2.33	58 5.9	2.37	20 22.1	2.30	24.6
27	15 59.4	16 7.1	58 34.4	2.36	59 2.4	2.29	21 18.9	2.43	25.6
28	16 14.4	16 21.2	59 29.3	+2.17	59 54.4	+1.99	22 18.5	2.52	26.6
29	16 27.4	16 32.6	60 17.0	1.75	60 36.4	1.46	23 19.4	2.54	27.6
30	16 36.9	16 40.0	60 52.1	1.13	61 3.5	+0.76	☌		28.6
31	16 41.9	16 42.4	61 10.4	+0.37	61 12.4	−0.03	0 20.0	2.50	0.3
32	16 41.7	16 39.7	61 9.6	−0.43	61 2.2	−0.80	1 19.1	2.42	1.3

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 15 41.36	2.5697	N.18 46 58.6	0.358
1	6 18 15.61	2.5719	18 47 16.2	0.227
2	6 20 49.99	2.5740	18 47 25.9	+ 0.095
3	6 23 24.49	2.5759	18 47 27.6	− 0.037
4	6 25 59.10	2.5778	18 47 21.4	0.169
5	6 28 33.83	2.5797	18 47 7.3	0.302
6	6 31 8.66	2.5813	18 46 45.2	0.435
7	6 33 43.58	2.5828	18 46 15.1	0.567
8	6 36 18.59	2.5843	18 45 37.1	0.700
9	6 38 53.69	2.5857	18 44 51.1	0.834
10	6 41 28.87	2.5869	18 43 57.1	0.968
11	6 44 4.12	2.5879	18 42 55.0	1.101
12	6 46 39.42	2.5889	18 41 45.0	1.233
13	6 49 14.78	2.5898	18 40 27.0	1.367
14	6 51 50.20	2.5906	18 39 0.9	1.501
15	6 54 25.66	2.5913	18 37 26.8	1.635
16	6 57 1.16	2.5919	18 35 44.7	1.768
17	6 59 36.69	2.5924	18 33 54.6	1.902
18	7 2 12.25	2.5927	18 31 56.5	2.035
19	7 4 47.82	2.5930	18 29 50.4	2.168
20	7 7 23.41	2.5932	18 27 36.3	2.302
21	7 9 59.00	2.5932	18 25 14.2	2.434
22	7 12 34.59	2.5932	18 22 44.2	2.567
23	7 15 10.18	2.5931	N.18 20 6.2	2.699

FRIDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 17 45.76	2.5928	N.18 17 20.3	2.832
1	7 20 21.32	2.5924	18 14 26.4	2.963
2	7 22 56.85	2.5919	18 11 24.7	3.094
3	7 25 32.35	2.5913	18 8 15.1	3.225
4	7 28 7.81	2.5907	18 4 57.7	3.356
5	7 30 43.22	2.5899	18 1 32.4	3.487
6	7 33 18.60	2.5891	17 57 59.3	3.617
7	7 35 53.92	2.5882	17 54 18.4	3.746
8	7 38 29.18	2.5871	17 50 29.8	3.874
9	7 41 4.37	2.5858	17 46 33.5	4.002
10	7 43 39.48	2.5845	17 42 29.5	4.130
11	7 46 14.51	2.5832	17 38 17.9	4.257
12	7 48 49.46	2.5818	17 33 58.6	4.384
13	7 51 24.32	2.5803	17 29 31.8	4.509
14	7 53 59.09	2.5787	17 24 57.5	4.634
15	7 56 33.76	2.5769	17 20 15.7	4.759
16	7 59 8.32	2.5751	17 15 26.4	4.883
17	8 1 42.77	2.5732	17 10 29.7	5.006
18	8 4 17.10	2.5712	17 5 25.7	5.128
19	8 6 51.31	2.5692	17 0 14.3	5.250
20	8 9 25.39	2.5670	16 54 55.7	5.370
21	8 11 59.35	2.5648	16 49 29.9	5.490
22	8 14 33.17	2.5624	16 43 56.9	5.609
23	8 17 6.84	2.5600	16 38 16.8	5.727
24	8 19 40.37	2.5576	N.16 32 29.7	5.843

SATURDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 19 40.37	2.5576	N.16 32 29.7	5.843
1	8 22 13.75	2.5550	16 26 35.6	5.960
2	8 24 46.97	2.5524	16 20 34.5	6.076
3	8 27 20.04	2.5498	16 14 26.5	6.190
4	8 29 52.95	2.5471	16 8 11.7	6.303
5	8 32 25.69	2.5442	16 1 50.1	6.416
6	8 34 58.25	2.5413	15 55 21.8	6.528
7	8 37 30.64	2.5383	15 48 46.8	6.638
8	8 40 2.85	2.5353	15 42 5.3	6.746
9	8 42 34.88	2.5322	15 35 17.3	6.853
10	8 45 6.72	2.5291	15 28 22.9	6.961
11	8 47 38.37	2.5260	15 21 22.0	7.067
12	8 50 9.84	2.5228	15 14 14.8	7.172
13	8 52 41.11	2.5195	15 7 1.3	7.276
14	8 55 12.18	2.5161	14 59 41.7	7.378
15	8 57 43.04	2.5127	14 52 16.0	7.479
16	9 0 13.70	2.5092	14 44 44.2	7.579
17	9 2 44.15	2.5058	14 37 6.5	7.677
18	9 5 14.40	2.5023	14 29 22.9	7.775
19	9 7 44.43	2.4988	14 21 33.5	7.872
20	9 10 14.25	2.4952	14 13 38.3	7.968
21	9 12 43.85	2.4915	14 5 37.4	8.062
22	9 15 13.23	2.4878	13 57 30.9	8.154
23	9 17 42.39	2.4841	N.13 49 18.9	8.245

SUNDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 20 11.32	2.4803	N.13 41 1.5	8.334
1	9 22 40.03	2.4766	13 32 38.8	8.423
2	9 25 8.51	2.4728	13 24 10.7	8.512
3	9 27 36.77	2.4690	13 15 37.4	8.598
4	9 30 4.79	2.4651	13 6 59.0	8.683
5	9 32 32.58	2.4612	12 58 15.5	8.767
6	9 35 0.14	2.4574	12 49 27.0	8.848
7	9 37 27.47	2.4535	12 40 33.7	8.929
8	9 39 54.56	2.4495	12 31 35.5	9.010
9	9 42 21.41	2.4455	12 22 32.5	9.088
10	9 44 48.02	2.4416	12 13 24.9	9.164
11	9 47 14.40	2.4377	12 4 12.8	9.239
12	9 49 40.54	2.4337	11 54 56.2	9.313
13	9 52 6.44	2.4297	11 45 35.2	9.387
14	9 54 32.10	2.4257	11 36 9.8	9.458
15	9 56 57.52	2.4217	11 26 40.2	9.528
16	9 59 22.70	2.4177	11 17 6.4	9.597
17	10 1 47.65	2.4138	11 7 28.6	9.664
18	10 4 12.36	2.4098	10 57 46.8	9.730
19	10 6 36.83	2.4058	10 48 1.0	9.795
20	10 9 1.06	2.4017	10 38 11.4	9.858
21	10 11 25.04	2.3977	10 28 18.1	9.919
22	10 13 48.78	2.3937	10 18 21.1	9.980
23	10 16 12.29	2.3898	10 8 20.5	10.038
24	10 18 35.56	2.3858	N. 9 58 16.5	10.095

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 18 35.56	2.3858	N. 9 58 16.5	10.095
1	10 20 58.59	2.3818	9 48 9.1	10.152
2	10 23 21.38	2.3779	9 37 58.3	10.208
3	10 25 43.94	2.3740	9 27 44.1	10.262
4	10 28 6.26	2.3701	9 17 26.8	10.313
5	10 30 28.35	2.3662	9 7 6.5	10.363
6	10 32 50.20	2.3623	8 56 43.2	10.413
7	10 35 11.82	2.3584	8 46 16.9	10.462
8	10 37 33.21	2.3545	8 35 47.8	10.508
9	10 39 54.36	2.3507	8 25 16.0	10.553
10	10 42 15.29	2.3469	8 14 41.5	10.597
11	10 44 35.99	2.3431	8 4 4.4	10.639
12	10 46 56.46	2.3393	7 53 24.8	10.681
13	10 49 16.71	2.3356	7 42 42.7	10.721
14	10 51 36.73	2.3319	7 31 58.3	10.759
15	10 53 56.53	2.3282	7 21 11.6	10.797
16	10 56 16.11	2.3246	7 10 22.7	10.833
17	10 58 35.48	2.3210	6 59 31.7	10.867
18	11 0 54.63	2.3173	6 48 38.7	10.900
19	11 3 13.56	2.3137	6 37 43.7	10.932
20	11 5 32.28	2.3102	6 26 46.8	10.962
21	11 7 50.79	2.3067	6 15 48.2	10.992
22	11 10 9.09	2.3032	6 4 47.8	11.020
23	11 12 27.18	2.2997	N. 5 53 45.8	11.046

TUESDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 14 45.06	2.2963	N. 5 42 42.3	11.071
1	11 17 2.74	2.2930	5 31 37.3	11.096
2	11 19 20.22	2.2897	5 20 30.8	11.119
3	11 21 37.50	2.2864	5 9 23.0	11.140
4	11 23 54.58	2.2831	4 58 14.0	11.161
5	11 26 11.47	2.2798	4 47 3.7	11.181
6	11 28 28.16	2.2766	4 35 52.3	11.198
7	11 30 44.66	2.2735	4 24 39.9	11.215
8	11 33 0.98	2.2704	4 13 26.5	11.230
9	11 35 17.11	2.2673	4 2 12.3	11.244
10	11 37 33.06	2.2643	3 50 57.2	11.257
11	11 39 48.83	2.2613	3 39 41.4	11.269
12	11 42 4.42	2.2584	3 28 24.9	11.280
13	11 44 19.84	2.2555	3 17 7.8	11.289
14	11 46 35.08	2.2526	3 5 50.2	11.297
15	11 48 50.15	2.2497	2 54 32.2	11.304
16	11 51 5.05	2.2470	2 43 13.8	11.310
17	11 53 19.79	2.2443	2 31 55.0	11.315
18	11 55 34.37	2.2417	2 20 36.0	11.318
19	11 57 48.79	2.2390	2 9 16.9	11.320
20	12 0 3.05	2.2363	1 57 57.6	11.322
21	12 2 17.15	2.2337	1 46 38.3	11.322
22	12 4 31.10	2.2312	1 35 19.0	11.321
23	12 6 44.90	2.2288	1 23 59.8	11.318
24	12 8 58.56	2.2265	N. 1 12 40.8	11.315

WEDNESDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 8 58.56	2.2265	N. 1 12 40.8	11.315
1	12 11 12.08	2.2241	1 1 22.0	11.311
2	12 13 25.45	2.2217	0 50 3.5	11.305
3	12 15 38.68	2.2194	0 38 45.4	11.298
4	12 17 51.78	2.2172	0 27 27.7	11.291
5	12 20 4.74	2.2149	0 16 10.5	11.282
6	12 22 17.57	2.2127	N. 0 4 53.9	11.272
7	12 24 30.27	2.2107	S. 0 6 22.1	11.261
8	12 26 42.85	2.2087	0 17 37.4	11.249
9	12 28 55.31	2.2067	0 28 52.0	11.237
10	12 31 7.65	2.2047	0 40 5.8	11.223
11	12 33 19.87	2.2027	0 51 18.7	11.208
12	12 35 31.98	2.2009	1 2 30.7	11.192
13	12 37 43.98	2.1991	1 13 41.7	11.174
14	12 39 55.87	2.1973	1 24 51.6	11.156
15	12 42 7.65	2.1955	1 36 0.4	11.137
16	12 44 19.33	2.1938	1 47 8.1	11.117
17	12 46 30.91	2.1922	1 58 14.5	11.096
18	12 48 42.39	2.1906	2 9 19.6	11.074
19	12 50 53.78	2.1891	2 20 23.3	11.051
20	12 53 5.08	2.1876	2 31 25.7	11.027
21	12 55 16.29	2.1861	2 42 26.6	11.002
22	12 57 27.41	2.1846	2 53 25.9	10.976
23	12 59 38.44	2.1832	S. 3 4 23.7	10.950

THURSDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 1 49.39	2.1819	S. 3 15 19.9	10.922
1	13 4 0.27	2.1807	3 26 14.4	10.893
2	13 6 11.07	2.1794	3 37 7.1	10.863
3	13 8 21.79	2.1781	3 47 58.0	10.833
4	13 10 32.44	2.1769	3 58 47.1	10.802
5	13 12 43.02	2.1758	4 9 34.3	10.769
6	13 14 53.54	2.1747	4 20 19.4	10.735
7	13 17 3.99	2.1737	4 31 2.5	10.702
8	13 19 14.38	2.1727	4 41 43.6	10.668
9	13 21 24.72	2.1718	4 52 22.6	10.632
10	13 23 35.00	2.1709	5 2 59.4	10.595
11	13 25 45.23	2.1701	5 13 34.0	10.557
12	13 27 55.41	2.1692	5 24 6.3	10.519
13	13 30 5.54	2.1684	5 34 36.3	10.480
14	13 32 15.62	2.1677	5 45 3.9	10.439
15	13 34 25.66	2.1669	5 55 29.0	10.398
16	13 36 35.65	2.1662	6 5 51.7	10.356
17	13 38 45.61	2.1656	6 16 11.8	10.313
18	13 40 55.53	2.1651	6 26 29.3	10.270
19	13 43 5.42	2.1645	6 36 44.2	10.227
20	13 45 15.27	2.1639	6 46 56.5	10.182
21	13 47 25.09	2.1635	6 57 6.0	10.135
22	13 49 34.89	2.1631	7 7 12.7	10.088
23	13 51 44.66	2.1626	7 17 16.6	10.042
24	13 53 54.40	2.1622	S. 7 27 17.7	9.994

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 53 54.40	2.1622	S. 7 27 17.7	9.994
1	13 56 4.12	2.1618	7 37 15.9	9.945
2	13 58 13.82	2.1616	7 47 11.1	9.895
3	14 0 23.51	2.1613	7 57 3.3	9.844
4	14 2 33.18	2.1611	8 6 52.4	9.793
5	14 4 42.84	2.1608	8 16 38.4	9.741
6	14 6 52.48	2.1606	8 26 21.3	9.688
7	14 9 2.11	2.1605	8 36 1.0	9.635
8	14 11 11.74	2.1604	8 45 37.5	9.581
9	14 13 21.36	2.1603	8 55 10.7	9.526
10	14 15 30.98	2.1602	9 4 40.6	9.470
11	14 17 40.59	2.1602	9 14 7.1	9.413
12	14 19 50.20	2.1602	9 23 30.2	9.356
13	14 21 59.81	2.1602	9 32 49.8	9.298
14	14 24 9.43	2.1603	9 42 6.0	9.241
15	14 26 19.05	2.1603	9 51 18.7	9.182
16	14 28 28.67	2.1604	10 0 27.8	9.122
17	14 30 38.30	2.1606	10 9 33.3	9.061
18	14 32 47.94	2.1608	10 18 35.1	8.999
19	14 34 57.59	2.1609	10 27 33.2	8.937
20	14 37 7.25	2.1611	10 36 27.6	8.875
21	14 39 16.92	2.1613	10 45 18.2	8.812
22	14 41 26.61	2.1616	10 54 5.0	8.748
23	14 43 36.31	2.1618	S. 11 2 47.9	8.684

SATURDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 45 46.02	2.1620	S. 11 11 27.0	8.619
1	14 47 55.75	2.1623	11 20 2.2	8.552
2	14 50 5.50	2.1627	11 28 33.3	8.485
3	14 52 15.27	2.1630	11 37 0.4	8.418
4	14 54 25.06	2.1633	11 45 23.5	8.351
5	14 56 34.87	2.1637	11 53 42.5	8.282
6	14 58 44.71	2.1641	12 1 57.4	8.213
7	15 0 54.57	2.1645	12 10 8.1	8.143
8	15 3 4.45	2.1649	12 18 14.6	8.074
9	15 5 14.36	2.1653	12 26 17.0	8.004
10	15 7 24.29	2.1657	12 34 15.1	7.932
11	15 9 34.25	2.1662	12 42 8.9	7.860
12	15 11 44.24	2.1667	12 49 58.3	7.788
13	15 13 54.26	2.1672	12 57 43.4	7.715
14	15 16 4.30	2.1676	13 5 24.1	7.641
15	15 18 14.37	2.1681	13 13 0.3	7.567
16	15 20 24.47	2.1686	13 20 32.1	7.492
17	15 22 34.60	2.1692	13 27 59.4	7.417
18	15 24 44.77	2.1697	13 35 22.1	7.341
19	15 26 54.96	2.1701	13 42 40.3	7.265
20	15 29 5.18	2.1706	13 49 53.9	7.188
21	15 31 15.44	2.1712	13 57 2.9	7.111
22	15 33 25.73	2.1717	14 4 7.2	7.033
23	15 35 36.05	2.1722	14 11 6.9	6.956
24	15 37 46.40	2.1727	S. 14 18 1.9	6.877

SUNDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 37 46.40	2.1727	S. 14 18 1.9	6.877
1	15 39 56.78	2.1733	14 24 52.1	6.797
2	15 42 7.20	2.1739	14 31 37.5	6.717
3	15 44 17.65	2.1744	14 38 18.1	6.637
4	15 46 28.13	2.1749	14 44 53.9	6.556
5	15 48 38.64	2.1754	14 51 24.8	6.475
6	15 50 49.18	2.1759	14 57 50.9	6.394
7	15 52 59.75	2.1764	15 4 12.1	6.311
8	15 55 10.35	2.1770	15 10 28.3	6.228
9	15 57 20.99	2.1776	15 16 39.5	6.145
10	15 59 31.66	2.1781	15 22 45.7	6.062
11	16 1 42.36	2.1785	15 28 46.9	5.978
12	16 3 53.08	2.1790	15 34 43.1	5.894
13	16 6 3.84	2.1796	15 40 34.2	5.809
14	16 8 14.63	2.1800	15 46 20.2	5.724
15	16 10 25.44	2.1803	15 52 1.1	5.638
16	16 12 36.27	2.1807	15 57 36.8	5.553
17	16 14 47.13	2.1812	16 3 7.4	5.467
18	16 16 58.02	2.1817	16 8 32.8	5.380
19	16 19 8.94	2.1821	16 13 53.0	5.293
20	16 21 19.88	2.1825	16 19 8.0	5.206
21	16 23 30.84	2.1829	16 24 17.7	5.118
22	16 25 41.83	2.1833	16 29 22.1	5.029
23	16 27 52.84	2.1837	S. 16 34 21.2	4.941

MONDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	16 30 3.87	2.1840	S. 16 39 15.1	4.853
1	16 32 14.92	2.1843	16 44 3.6	4.763
2	16 34 25.99	2.1846	16 48 46.7	4.674
3	16 36 37.08	2.1849	16 53 24.5	4.585
4	16 38 48.18	2.1852	16 57 56.9	4.495
5	16 40 59.30	2.1854	17 2 23.9	4.405
6	16 43 10.43	2.1856	17 6 45.5	4.315
7	16 45 21.57	2.1858	17 11 1.7	4.224
8	16 47 32.73	2.1861	17 15 12.4	4.132
9	16 49 43.90	2.1862	17 19 17.6	4.041
10	16 51 55.08	2.1863	17 23 17.3	3.950
11	16 54 6.26	2.1864	17 27 11.6	3.859
12	16 56 17.45	2.1865	17 31 0.4	3.767
13	16 58 28.64	2.1866	17 34 43.6	3.674
14	17 0 39.84	2.1867	17 38 21.3	3.582
15	17 2 51.04	2.1867	17 41 53.5	3.490
16	17 5 2.24	2.1867	17 45 20.1	3.397
17	17 7 13.44	2.1867	17 48 41.1	3.304
18	17 9 24.64	2.1866	17 51 56.6	3.212
19	17 11 35.83	2.1865	17 55 6.5	3.118
20	17 13 47.02	2.1864	17 58 10.8	3.025
21	17 15 58.20	2.1863	18 1 9.5	2.931
22	17 18 9.37	2.1861	18 4 2.5	2.837
23	17 20 20.53	2.1858	18 6 49.9	2.743
24	17 22 31.67	2.1856	S. 18 9 31.7	2.649

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 22 31.67	2.1856	S. 18 9 31.7	2.649
1	17 24 42.80	2.1853	18 12 7.8	2.555
2	17 26 53.91	2.1851	18 14 38.3	2.461
3	17 29 5.01	2.1847	18 17 3.2	2.367
4	17 31 16.08	2.1843	18 19 22.4	2.273
5	17 33 27.13	2.1840	18 21 36.0	2.179
6	17 35 38.16	2.1836	18 23 43.9	2.084
7	17 37 49.16	2.1831	18 25 46.1	1.990
8	17 40 0.13	2.1827	18 27 42.7	1.896
9	17 42 11.08	2.1822	18 29 33.6	1.801
10	17 44 21.99	2.1816	18 31 18.8	1.707
11	17 46 32.87	2.1810	18 32 58.4	1.612
12	17 48 43.71	2.1804	18 34 32.3	1.517
13	17 50 54.52	2.1798	18 36 0.5	1.423
14	17 53 5.29	2.1791	18 37 23.1	1.329
15	17 55 16.01	2.1783	18 38 40.0	1.234
16	17 57 26.69	2.1776	18 39 51.2	1.139
17	17 59 37.32	2.1768	18 40 56.7	1.045
18	18 1 47.91	2.1761	18 41 56.6	0.951
19	18 3 58.45	2.1752	18 42 50.8	0.856
20	18 6 8.93	2.1743	18 43 39.3	0.762
21	18 8 19.36	2.1733	18 44 22.2	0.668
22	18 10 29.73	2.1724	18 44 59.5	0.574
23	18 12 40.05	2.1715	S. 18 45 31.1	0.480

WEDNESDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 14 50.31	2.1705	S. 18 45 57.1	0.386
1	18 17 0.51	2.1694	18 46 17.5	0.292
2	18 19 10.64	2.1683	18 46 32.2	0.198
3	18 21 20.70	2.1672	18 46 41.3	0.105
4	18 23 30.70	2.1660	18 46 44.8	− 0.012
5	18 25 40.62	2.1648	18 46 42.7	+ 0.082
6	18 27 50.47	2.1636	18 46 35.0	0.175
7	18 30 0.25	2.1623	18 46 21.7	0.267
8	18 32 9.95	2.1611	18 46 2.9	0.360
9	18 34 19.58	2.1598	18 45 38.5	0.452
10	18 36 29.13	2.1584	18 45 8.6	0.544
11	18 38 38.59	2.1570	18 44 33.2	0.637
12	18 40 47.97	2.1556	18 43 52.2	0.729
13	18 42 57.26	2.1542	18 43 5.7	0.821
14	18 45 6.47	2.1527	18 42 13.7	0.912
15	18 47 15.59	2.1512	18 41 16.3	1.003
16	18 49 24.61	2.1496	18 40 13.4	1.094
17	18 51 33.54	2.1481	18 39 5.0	1.186
18	18 53 42.38	2.1465	18 37 51.1	1.277
19	18 55 51.12	2.1448	18 36 31.8	1.366
20	18 57 59.76	2.1431	18 35 7.2	1.455
21	19 0 8.30	2.1414	18 33 37.2	1.545
22	19 2 16.73	2.1397	18 32 1.8	1.634
23	19 4 25.06	2.1380	18 30 21.1	1.723
24	19 6 33.29	2.1362	S. 18 28 35.0	1.812

THURSDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 6 33.29	2.1362	S. 18 28 35.0	1.812
1	19 8 41.41	2.1344	18 26 43.6	1.901
2	19 10 49.42	2.1326	18 24 46.9	1.989
3	19 12 57.32	2.1307	18 22 44.9	2.077
4	19 15 5.10	2.1288	18 20 37.7	2.164
5	19 17 12.77	2.1269	18 18 25.3	2.251
6	19 19 20.33	2.1250	18 16 7.6	2.338
7	19 21 27.77	2.1230	18 13 44.7	2.424
8	19 23 35.09	2.1210	18 11 16.7	2.510
9	19 25 42.29	2.1190	18 8 43.5	2.597
10	19 27 49.37	2.1170	18 6 5.1	2.682
11	19 29 56.33	2.1149	18 3 21.7	2.766
12	19 32 3.16	2.1128	18 0 33.2	2.850
13	19 34 9.87	2.1107	17 57 39.7	2.934
14	19 36 16.45	2.1086	17 54 41.1	3.018
15	19 38 22.90	2.1064	17 51 37.5	3.101
16	19 40 29.22	2.1043	17 48 28.9	3.184
17	19 42 35.41	2.1021	17 45 15.4	3.267
18	19 44 41.47	2.0998	17 41 56.9	3.349
19	19 46 47.39	2.0976	17 38 33.5	3.431
20	19 48 53.18	2.0954	17 35 5.2	3.512
21	19 50 58.84	2.0932	17 31 32.1	3.592
22	19 53 4.36	2.0909	17 27 54.1	3.672
23	19 55 9.74	2.0886	S. 17 24 11.4	3.752

FRIDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 57 14.99	2.0863	S. 17 20 23.9	3.832
1	19 59 20.10	2.0840	17 16 31.6	3.911
2	20 1 25.07	2.0817	17 12 34.6	3.989
3	20 3 29.90	2.0793	17 8 32.9	4.067
4	20 5 34.58	2.0769	17 4 26.5	4.145
5	20 7 39.12	2.0745	17 0 15.5	4.222
6	20 9 43.52	2.0722	16 55 59.9	4.298
7	20 11 47.78	2.0698	16 51 39.7	4.374
8	20 13 51.89	2.0673	16 47 15.0	4.450
9	20 15 55.86	2.0649	16 42 45.7	4.526
10	20 17 59.68	2.0625	16 38 11.9	4.600
11	20 20 3.36	2.0601	16 33 33.7	4.673
12	20 22 6.89	2.0576	16 28 51.1	4.747
13	20 24 10.27	2.0552	16 24 4.1	4.820
14	20 26 13.51	2.0527	16 19 12.7	4.892
15	20 28 16.60	2.0502	16 14 17.0	4.964
16	20 30 19.54	2.0478	16 9 17.0	5.036
17	20 32 22.34	2.0454	16 4 12.7	5.107
18	20 34 24.99	2.0429	15 59 4.1	5.178
19	20 36 27.49	2.0404	15 53 51.3	5.248
20	20 38 29.84	2.0379	15 48 34.4	5.317
21	20 40 32.04	2.0354	15 43 13.3	5.386
22	20 42 34.09	2.0329	15 37 48.1	5.454
23	20 44 35.99	2.0305	15 32 18.8	5.522
24	20 46 37.75	2.0280	S. 15 26 45.4	5.590

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 17.			
	h m s	s	° ′ ″	″
0	20 46 37.75	2.0260	S. 15 26 45.4	5.590
1	20 48 39.35	2.0254	15 21 8.0	5.657
2	20 50 40.80	2.0230	15 15 26.6	5.723
3	20 52 42.11	2.0207	15 9 41.3	5.788
4	20 54 43.28	2.0183	15 3 52.0	5.853
5	20 56 44.30	2.0158	14 57 58.9	5.918
6	20 58 45.17	2.0133	14 52 1.9	5.983
7	21 0 45.89	2.0108	14 46 1.1	6.045
8	21 2 46.47	2.0084	14 39 56.5	6.108
9	21 4 46.90	2.0059	14 33 48.1	6.171
10	21 6 47.18	2.0035	14 27 36.0	6.232
11	21 8 47.32	2.0011	14 21 20.2	6.293
12	21 10 47.31	1.9987	14 15 0.8	6.354
13	21 12 47.16	1.9962	14 8 37.7	6.414
14	21 14 46.86	1.9938	14 2 11.1	6.473
15	21 16 46.42	1.9915	13 55 40.9	6.532
16	21 18 45.84	1.9892	13 49 7.2	6.591
17	21 20 45.12	1.9868	13 42 30.0	6.649
18	21 22 44.26	1.9844	13 35 49.3	6.707
19	21 24 43.25	1.9821	13 29 5.2	6.763
20	21 26 42.11	1.9798	13 22 17.7	6.819
21	21 28 40.83	1.9775	13 15 26.9	6.875
22	21 30 39.41	1.9752	13 8 32.7	6.931
23	21 32 37.86	1.9730	S. 13 1 35.2	6.985
	SUNDAY 18.			
0	21 34 36.17	1.9707	S. 12 54 34.5	7.038
1	21 36 34.35	1.9685	12 47 30.6	7.092
2	21 38 32.39	1.9663	12 40 23.5	7.145
3	21 40 30.30	1.9641	12 33 13.2	7.197
4	21 42 28.08	1.9619	12 25 59.8	7.249
5	21 44 25.73	1.9597	12 18 43.3	7.300
6	21 46 23.25	1.9576	12 11 23.8	7.350
7	21 48 20.64	1.9555	12 4 1.3	7.400
8	21 50 17.91	1.9534	11 56 35.8	7.450
9	21 52 15.05	1.9513	11 49 7.3	7.499
10	21 54 12.07	1.9492	11 41 35.9	7.547
11	21 56 8.96	1.9472	11 34 1.6	7.595
12	21 58 5.73	1.9452	11 26 24.5	7.642
13	22 0 2.38	1.9432	11 18 44.6	7.688
14	22 1 58.92	1.9413	11 11 1.9	7.735
15	22 3 55.34	1.9393	11 3 16.4	7.781
16	22 5 51.64	1.9374	10 55 28.2	7.826
17	22 7 47.83	1.9356	10 47 37.3	7.870
18	22 9 43.91	1.9337	10 39 43.8	7.913
19	22 11 39.88	1.9319	10 31 47.7	7.957
20	22 13 35.74	1.9301	10 23 49.0	8.000
21	22 15 31.49	1.9283	10 15 47.7	8.042
22	22 17 27.14	1.9266	10 7 43.9	8.084
23	22 19 22.69	1.9249	9 59 37.6	8.125
24	22 21 18.13	1.9232	S. 9 51 28.9	8.165

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 19.			
	h m s	s	° ′ ″	″
0	22 21 18.13	1.9232	S. 9 51 28.9	8.165
1	22 23 13.47	1.9215	9 43 17.8	8.205
2	22 25 8.71	1.9199	9 35 4.3	8.245
3	22 27 3.86	1.9184	9 26 48.4	8.284
4	22 28 58.92	1.9168	9 18 30.2	8.322
5	22 30 53.88	1.9152	9 10 9.8	8.359
6	22 32 48.75	1.9137	9 1 47.1	8.397
7	22 34 43.53	1.9122	8 53 22.2	8.433
8	22 36 38.22	1.9108	8 44 55.1	8.469
9	22 38 32.83	1.9095	8 36 25.9	8.505
10	22 40 27.36	1.9082	8 27 54.5	8.540
11	22 42 21.81	1.9068	8 19 21.1	8.574
12	22 44 16.18	1.9056	8 10 45.6	8.608
13	22 46 10.48	1.9043	8 2 8.1	8.642
14	22 48 4.70	1.9030	7 53 28.6	8.675
15	22 49 58.84	1.9018	7 44 47.1	8.707
16	22 51 52.91	1.9007	7 36 3.7	8.739
17	22 53 46.92	1.8996	7 27 18.4	8.770
18	22 55 40.86	1.8984	7 18 31.3	8.801
19	22 57 34.73	1.8974	7 9 42.3	8.831
20	22 59 28.55	1.8965	7 0 51.6	8.860
21	23 1 22.31	1.8955	6 51 59.1	8.889
22	23 3 16.01	1.8946	6 43 4.9	8.918
23	23 5 9.66	1.8937	S. 6 34 9.0	8.947
	TUESDAY 20.			
0	23 7 3.25	1.8928	S. 6 25 11.3	8.975
1	23 8 56.79	1.8920	6 16 12.0	9.001
2	23 10 50.29	1.8912	6 7 11.2	9.027
3	23 12 43.74	1.8905	5 58 8.8	9.053
4	23 14 37.15	1.8898	5 49 4.8	9.078
5	23 16 30.52	1.8892	5 39 59.3	9.103
6	23 18 23.86	1.8887	5 30 52.4	9.127
7	23 20 17.16	1.8881	5 21 44.0	9.151
8	23 22 10.43	1.8876	5 12 34.2	9.174
9	23 24 3.67	1.8871	5 3 23.1	9.197
10	23 25 56.88	1.8866	4 54 10.6	9.219
11	23 27 50.06	1.8862	4 44 56.8	9.241
12	23 29 43.22	1.8859	4 35 41.7	9.262
13	23 31 36.37	1.8856	4 26 25.3	9.283
14	23 33 29.50	1.8853	4 17 7.7	9.303
15	23 35 22.61	1.8851	4 7 49.0	9.322
16	23 37 15.71	1.8849	3 58 29.1	9.341
17	23 39 8.80	1.8848	3 49 8.1	9.359
18	23 41 1.89	1.8847	3 39 46.0	9.377
19	23 42 54.97	1.8847	3 30 22.8	9.395
20	23 44 48.05	1.8847	3 20 58.6	9.412
21	23 46 41.14	1.8848	3 11 33.4	9.428
22	23 48 34.23	1.8849	3 2 7.3	9.443
23	23 50 27.33	1.8850	2 52 40.2	9.459
24	23 52 20.43	1.8851	S. 2 43 12.2	9.473

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 21.					**FRIDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 52 20.43	1.8851	S. 2 43 12.2	9.473	0	1 23 59.45	1.9532	N. 4 58 3.9	9.525
1	23 54 13.54	1.8854	2 33 43.4	9.488	1	1 25 56.72	1.9558	5 7 35.0	9.512
2	23 56 6.68	1.8858	2 24 13.7	9.502	2	1 27 54.15	1.9585	5 17 5.3	9.498
3	23 57 59.84	1.8862	2 14 43.2	9.515	3	1 29 51.74	1.9613	5 26 34.8	9.483
4	23 59 53.02	1.8865	2 5 11.9	9.527	4	1 31 49.50	1.9642	5 36 3.3	9.468
5	0 1 46.22	1.8869	1 55 39.9	9.539	5	1 33 47.44	1.9672	5 45 30.9	9.452
6	0 3 39.45	1.8874	1 46 7.2	9.551	6	1 35 45.56	1.9701	5 54 57.5	9.435
7	0 5 32.71	1.8879	1 36 33.8	9.562	7	1 37 43.85	1.9730	6 4 23.1	9.417
8	0 7 26.00	1.8885	1 26 59.8	9.572	8	1 39 42.32	1.9761	6 13 47.6	9.399
9	0 9 19.33	1.8892	1 17 25.2	9.582	9	1 41 40.98	1.9792	6 23 11.0	9.380
10	0 11 12.70	1.8899	1 7 50.0	9.591	10	1 43 39.83	1.9824	6 32 33.2	9.360
11	0 13 6.11	1.8906	0 58 14.3	9.600	11	1 45 38.87	1.9856	6 41 54.2	9.340
12	0 14 59.57	1.8913	0 48 38.0	9.608	12	1 47 38.10	1.9888	6 51 14.0	9.319
13	0 16 53.07	1.8922	0 39 1.3	9.616	13	1 49 37.53	1.9921	7 0 32.5	9.297
14	0 18 46.63	1.8931	0 29 24.1	9.623	14	1 51 37.16	1.9955	7 9 49.7	9.275
15	0 20 40.24	1.8939	0 19 46.5	9.630	15	1 53 36.99	1.9989	7 19 5.5	9.252
16	0 22 33.90	1.8948	0 10 8.5	9.636	16	1 55 37.03	2.0024	7 28 19.9	9.228
17	0 24 27.62	1.8959	S. 0 0 30.2	9.641	17	1 57 37.28	2.0059	7 37 32.8	9.203
18	0 26 21.41	1.8970	N. 0 9 8.4	9.646	18	1 59 37.74	2.0095	7 46 44.3	9.178
19	0 28 15.26	1.8981	0 18 47.3	9.651	19	2 1 38.42	2.0132	7 55 54.2	9.152
20	0 30 9.18	1.8992	0 28 26.5	9.655	20	2 3 39.32	2.0168	8 5 2.5	9.125
21	0 32 3.17	1.9005	0 38 5.9	9.658	21	2 5 40.44	2.0205	8 14 9.2	9.097
22	0 33 57.24	1.9018	0 47 45.5	9.661	22	2 7 41.78	2.0243	8 23 14.2	9.069
23	0 35 51.39	1.9031	N. 0 57 25.2	9.663	23	2 9 43.35	2.0281	N. 8 32 17.5	9.040
	THURSDAY 22.					**SATURDAY 24.**			
0	0 37 45.61	1.9044	N. 1 7 5.0	9.664	0	2 11 45.15	2.0320	N. 8 41 19.0	9.010
1	0 39 39.92	1.9059	1 16 44.9	9.665	1	2 13 47.19	2.0359	8 50 18.7	8.979
2	0 41 34.32	1.9073	1 26 24.8	9.666	2	2 15 49.46	2.0398	8 59 16.5	8.948
3	0 43 28.80	1.9088	1 36 4.8	9.666	3	2 17 51.97	2.0438	9 8 12.4	8.916
4	0 45 23.38	1.9105	1 45 44.7	9.665	4	2 19 54.72	2.0479	9 17 6.4	8.882
5	0 47 18.06	1.9122	1 55 24.6	9.664	5	2 21 57.72	2.0520	9 25 58.3	8.848
6	0 49 12.84	1.9139	2 5 4.4	9.663	6	2 24 0.96	2.0562	9 34 48.2	8.814
7	0 51 7.72	1.9156	2 14 44.1	9.661	7	2 26 4.46	2.0604	9 43 36.0	8.778
8	0 53 2.71	1.9173	2 24 23.6	9.657	8	2 28 8.21	2.0646	9 52 21.6	8.742
9	0 54 57.80	1.9192	2 34 2.9	9.652	9	2 30 12.21	2.0688	10 1 5.1	8.706
10	0 56 53.01	1.9211	2 43 41.9	9.648	10	2 32 16.47	2.0732	10 9 46.3	8.667
11	0 58 48.33	1.9230	2 53 20.7	9.644	11	2 34 21.00	2.0776	10 18 25.1	8.628
12	1 0 43.77	1.9250	3 2 59.2	9.638	12	2 36 25.79	2.0820	10 27 1.6	8.588
13	1 2 39.33	1.9271	3 12 37.3	9.633	13	2 38 30.84	2.0865	10 35 35.7	8.548
14	1 4 35.02	1.9292	3 22 15.1	9.627	14	2 40 36.17	2.0911	10 44 7.4	8.507
15	1 6 30.83	1.9313	3 31 52.5	9.619	15	2 42 41.77	2.0957	10 52 36.6	8.465
16	1 8 26.78	1.9336	3 41 29.4	9.611	16	2 44 47.65	2.1002	11 1 3.2	8.421
17	1 10 22.86	1.9359	3 51 5.8	9.603	17	2 46 53.80	2.1048	11 9 27.1	8.376
18	1 12 19.08	1.9382	4 0 41.7	9.594	18	2 49 0.23	2.1095	11 17 48.3	8.331
19	1 14 15.44	1.9405	4 10 17.1	9.584	19	2 51 6.94	2.1143	11 26 6.8	8.286
20	1 16 11.94	1.9429	4 19 51.8	9.573	20	2 53 13.94	2.1191	11 34 22.6	8.240
21	1 18 8.59	1.9454	4 29 25.9	9.562	21	2 55 21.23	2.1239	11 42 35.6	8.192
22	1 20 5.39	1.9479	4 38 59.3	9.551	22	2 57 28.81	2.1287	11 50 45.7	8.143
23	1 22 2.34	1.9505	4 48 32.0	9.538	23	2 59 36.68	2.1336	11 58 52.8	8.093
24	1 23 59.45	1.9532	N. 4 58 3.9	9.525	24	3 1 44.84	2.1385	N.12 6 56.9	8.043

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 1 44.84	2.1385	N.12 6 56.9	8.043
1	3 3 53.30	2.1435	12 14 58.0	7.992
2	3 6 2.06	2.1485	12 22 56.0	7.940
3	3 8 11.12	2.1535	12 30 50.8	7.887
4	3 10 20.48	2.1586	12 38 42.4	7.832
5	3 12 30.14	2.1636	12 46 30.7	7.777
6	3 14 40.11	2.1687	12 54 15.6	7.720
7	3 16 50.39	2.1739	13 1 57.1	7.663
8	3 19 0.98	2.1791	13 9 35.2	7.606
9	3 21 11.88	2.1843	13 17 9.8	7.547
10	3 23 23.09	2.1895	13 24 40.8	7.487
11	3 25 34.62	2.1947	13 32 8.2	7.426
12	3 27 46.46	2.2000	13 39 31.9	7.364
13	3 29 58.62	2.2053	13 46 51.8	7.301
14	3 32 11.10	2.2107	13 54 8.0	7.237
15	3 34 23.91	2.2161	14 1 20.3	7.172
16	3 36 37.04	2.2215	14 8 28.6	7.105
17	3 38 50.49	2.2268	14 15 32.9	7.038
18	3 41 4.26	2.2322	14 22 33.2	6.971
19	3 43 18.36	2.2377	14 29 29.4	6.902
20	3 45 32.79	2.2432	14 36 21.4	6.831
21	3 47 47.55	2.2487	14 43 9.1	6.759
22	3 50 2.64	2.2542	14 49 52.5	6.687
23	3 52 18.06	2.2597	N.14 56 31.6	6.615

MONDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	3 54 33.80	2.2652	N.15 3 6.3	6.541
1	3 56 49.88	2.2707	15 9 36.5	6.465
2	3 59 6.29	2.2762	15 16 2.1	6.388
3	4 1 23.03	2.2817	15 22 23.1	6.311
4	4 3 40.10	2.2873	15 28 39.4	6.232
5	4 5 57.51	2.2929	15 34 51.0	6.152
6	4 8 15.25	2.2984	15 40 57.7	6.072
7	4 10 33.32	2.3040	15 46 59.6	5.991
8	4 12 51.73	2.3096	15 52 56.6	5.907
9	4 15 10.47	2.3151	15 58 48.5	5.823
10	4 17 29.54	2.3207	16 4 35.4	5.739
11	4 19 48.95	2.3262	16 10 17.2	5.652
12	4 22 8.69	2.3317	16 15 53.7	5.565
13	4 24 28.76	2.3372	16 21 25.0	5.477
14	4 26 49.16	2.3428	16 26 51.0	5.388
15	4 29 9.90	2.3484	16 32 11.6	5.298
16	4 31 30.97	2.3539	16 37 26.7	5.207
17	4 33 52.37	2.3593	16 42 36.4	5.115
18	4 36 14.09	2.3647	16 47 40.5	5.021
19	4 38 36.14	2.3702	16 52 38.9	4.927
20	4 40 58.52	2.3757	16 57 31.7	4.832
21	4 43 21.22	2.3811	17 2 18.7	4.734
22	4 45 44.25	2.3865	17 6 59.8	4.636
23	4 48 7.60	2.3918	17 11 35.1	4.538
24	4 50 31.27	2.3972	N.17 16 4.4	4.438

TUESDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 50 31.27	2.3972	N.17 16 4.4	4.438
1	4 52 55.26	2.4025	17 20 27.7	4.338
2	4 55 19.57	2.4077	17 24 45.0	4.237
3	4 57 44.19	2.4129	17 28 56.1	4.134
4	5 0 9.13	2.4182	17 33 1.0	4.030
5	5 2 34.37	2.4233	17 36 59.7	3.925
6	5 4 59.92	2.4284	17 40 52.0	3.819
7	5 7 25.78	2.4335	17 44 38.0	3.712
8	5 9 51.94	2.4386	17 48 17.6	3.605
9	5 12 18.41	2.4437	17 51 50.6	3.496
10	5 14 45.18	2.4486	17 55 17.1	3.387
11	5 17 12.24	2.4535	17 58 37.0	3.277
12	5 19 39.60	2.4584	18 1 50.3	3.166
13	5 22 7.25	2.4632	18 4 56.9	3.053
14	5 24 35.18	2.4679	18 7 56.7	2.939
15	5 27 3.40	2.4726	18 10 49.6	2.824
16	5 29 31.90	2.4773	18 13 35.6	2.709
17	5 32 0.68	2.4819	18 16 14.7	2.594
18	5 34 29.73	2.4864	18 18 46.9	2.477
19	5 36 59.05	2.4908	18 21 12.0	2.360
20	5 39 28.63	2.4952	18 23 30.1	2.242
21	5 41 58.48	2.4996	18 25 41.0	2.122
22	5 44 28.59	2.5039	18 27 44.7	2.002
23	5 46 58.95	2.5081	N.18 29 41.2	1.881

WEDNESDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	5 49 29.56	2.5122	N.18 31 30.4	1.759
1	5 52 0.41	2.5163	18 33 12.3	1.637
2	5 54 31.51	2.5203	18 34 46.8	1.514
3	5 57 2.85	2.5242	18 36 14.0	1.391
4	5 59 34.42	2.5280	18 37 33.7	1.266
5	6 2 6.21	2.5317	18 38 45.9	1.141
6	6 4 38.23	2.5354	18 39 50.6	1.015
7	6 7 10.46	2.5390	18 40 47.7	0.888
8	6 9 42.91	2.5426	18 41 37.2	0.762
9	6 12 15.57	2.5460	18 42 19.1	0.634
10	6 14 48.43	2.5493	18 42 53.3	0.506
11	6 17 21.49	2.5526	18 43 19.8	0.377
12	6 19 54.74	2.5557	18 43 38.6	0.248
13	6 22 28.17	2.5588	18 43 49.6	+ 0.118
14	6 25 1.79	2.5618	18 43 52.8	− 0.012
15	6 27 35.59	2.5647	18 43 48.1	0.143
16	6 30 9.56	2.5675	18 43 35.6	0.274
17	6 32 43.69	2.5702	18 43 15.2	0.405
18	6 35 17.98	2.5728	18 42 47.0	0.537
19	6 37 52.42	2.5753	18 42 10.8	0.669
20	6 40 27.01	2.5778	18 41 26.7	0.802
21	6 43 1.75	2.5802	18 40 34.6	0.935
22	6 45 36.63	2.5824	18 39 34.5	1.068
23	6 48 11.64	2.5845	18 38 26.4	1.202
24	6 50 46.77	2.5865	N.18 37 10.3	1.335

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 50 46.77	2.5865	N.18 37 10.3	1.335
1	6 53 22.02	2.5884	18 35 46.2	1.468
2	6 55 57.38	2.5902	18 34 14.1	1.602
3	6 58 32.85	2.5920	18 32 33.9	1.737
4	7 1 8.42	2.5936	18 30 45.7	1.871
5	7 3 44.08	2.5951	18 28 49.4	2.005
6	7 6 19.83	2.5965	18 26 45.1	2.139
7	7 8 55.66	2.5978	18 24 32.7	2.273
8	7 11 31.57	2.5991	18 22 12.3	2.407
9	7 14 7.55	2.6002	18 19 43.8	2.542
10	7 16 43.59	2.6012	18 17 7.3	2.676
11	7 19 19.69	2.6021	18 14 22.7	2.810
12	7 21 55.84	2.6028	18 11 30.1	2.943
13	7 24 32.03	2.6035	18 8 29.5	3.077
14	7 27 8.26	2.6042	18 5 20.9	3.211
15	7 29 44.53	2.6047	18 2 4.2	3.344
16	7 32 20.82	2.6050	17 58 39.6	3.477
17	7 34 57.13	2.6052	17 55 7.0	3.610
18	7 37 33.45	2.6054	17 51 26.4	3.742
19	7 40 9.78	2.6055	17 47 37.9	3.874
20	7 42 46.11	2.6055	17 43 41.5	4.006
21	7 45 22.44	2.6054	17 39 37.2	4.137
22	7 47 58.76	2.6052	17 35 25.1	4.267
23	7 50 35.06	2.6048	N.17 31 5.1	4.398

FRIDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 53 11.33	2.6043	N.17 26 37.3	4.528
1	7 55 47.58	2.6038	17 22 1.7	4.658
2	7 58 23.79	2.6032	17 17 18.4	4.787
3	8 0 59.96	2.6025	17 12 27.3	4.915
4	8 3 36.09	2.6017	17 7 28.6	5.042
5	8 6 12.17	2.6008	17 2 22.2	5.170
6	8 8 48.19	2.5998	16 57 8.2	5.297
7	8 11 24.14	2.5987	16 51 46.6	5.422
8	8 14 0.03	2.5976	16 46 17.6	5.546
9	8 16 35.85	2.5963	16 40 41.1	5.670
10	8 19 11.59	2.5949	16 34 57.2	5.794
11	8 21 47.24	2.5934	16 29 5.9	5.917
12	8 24 22.80	2.5919	16 23 7.2	6.039
13	8 26 58.27	2.5903	16 17 1.2	6.160
14	8 29 33.64	2.5886	16 10 48.0	6.279
15	8 32 8.90	2.5868	16 4 27.7	6.398
16	8 34 44.05	2.5849	15 58 0.2	6.517
17	8 37 19.09	2.5830	15 51 25.7	6.633
18	8 39 54.01	2.5810	15 44 44.2	6.749
19	8 42 28.81	2.5789	15 37 55.8	6.865
20	8 45 3.48	2.5767	15 31 0.4	6.980
21	8 47 38.02	2.5745	15 23 58.2	7.093
22	8 50 12.42	2.5722	15 16 49.3	7.205
23	8 52 46.68	2.5698	15 9 33.6	7.317
24	8 55 20.80	2.5674	N.15 2 11.3	7.427

SATURDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 55 20.80	2.5674	N.15 2 11.3	7.427
1	8 57 54.77	2.5648	14 54 42.4	7.535
2	9 0 28.58	2.5622	14 47 7.1	7.642
3	9 3 2.24	2.5596	14 39 25.4	7.748
4	9 5 35.74	2.5569	14 31 37.3	7.853
5	9 8 9.07	2.5542	14 23 43.0	7.957
6	9 10 42.24	2.5513	14 15 42.5	8.060
7	9 13 15.23	2.5484	14 7 35.8	8.162
8	9 15 48.05	2.5456	13 59 23.1	8.262
9	9 18 20.70	2.5427	13 51 4.4	8.361
10	9 20 53.17	2.5396	13 42 39.8	8.458
11	9 23 25.45	2.5365	13 34 9.4	8.554
12	9 25 57.55	2.5334	13 25 33.3	8.648
13	9 28 29.46	2.5302	13 16 51.6	8.742
14	9 31 1.18	2.5270	13 8 4.2	8.836
15	9 33 32.70	2.5237	12 59 11.3	8.927
16	9 36 4.02	2.5204	12 50 13.0	9.016
17	9 38 35.15	2.5172	12 41 9.4	9.104
18	9 41 6.08	2.5138	12 32 0.5	9.192
19	9 43 36.80	2.5103	12 22 46.4	9.277
20	9 46 7.32	2.5069	12 13 27.3	9.359
21	9 48 37.63	2.5034	12 4 3.3	9.441
22	9 51 7.73	2.4999	11 54 34.4	9.522
23	9 53 37.62	2.4965	N.11 45 0.6	9.602

SUNDAY, AUGUST 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 56 7.31	2.4930	N.11 35 22.1	9.680

PHASES OF THE MOON.

		d	h	m
● New Moon . .	July	1	10	6.6
☽ First Quarter . . .		8	1	18.1
○ Full Moon		15	15	8.9
☾ Last Quarter. . . .		23	19	21.3
● New Moon		30	17	25.9

		d	h
☾ Perigee. . . .	July	3	5.1
☾ Apogee.		18	18.7
☾ Perigee.		31	11.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
3	Sun	W.	22° 6′ 5″	2443	23° 48′ 38″	2433	25° 31′ 26″	2425	27° 14′ 25″	2419
	Jupiter	E.	55 16 12	2105	53 25 20	2105	51 34 28	2105	49 43 37	2107
	Mars	E.	57 40 1	2229	55 52 16	2229	54 4 32	2231	52 16 50	2232
	Spica	E.	78 50 33	2092	76 59 22	2094	75 8 13	2095	73 17 6	2097
4	Sun	W.	35 50 34	2415	37 33 48	2417	39 16 59	2420	41 0 5	2425
	Jupiter	E.	40 30 18	2124	38 39 55	2129	36 49 40	2134	34 59 33	2141
	Mars	E.	43 19 17	2251	41 32 5	2256	39 45 1	2263	37 58 7	2270
	Spica	E.	64 2 35	2116	62 12 0	2122	60 21 34	2128	58 31 18	2136
	Antares	E.	109 46 45	2160	107 57 17	2163	106 7 54	2167	104 18 37	2172
5	Sun	W.	49 33 40	2456	51 15 55	2465	52 57 58	2474	54 39 48	2483
	Mars	E.	29 6 22	2312	27 20 40	2323	25 35 14	2334	23 50 4	2346
	Spica	E.	49 22 59	2180	47 34 1	2191	45 45 20	2202	43 56 56	2214
	Antares	E.	95 14 23	2206	93 26 4	2214	91 37 57	2223	89 50 4	2233
6	Sun	W.	63 5 34	2535	64 45 59	2546	66 26 8	2558	68 6 1	2569
	Regulus	W.	19 7 24	2233	20 55 3	2242	22 42 28	2252	24 29 38	2262
	Spica	E.	34 59 52	2288	33 13 35	2306	31 27 44	2325	29 42 21	2346
	Antares	E.	80 54 21	2286	79 8 1	2298	77 21 59	2310	75 36 14	2323
7	Sun	W.	76 21 14	2633	77 59 24	2646	79 37 17	2659	81 14 52	2672
	Regulus	W.	33 21 27	2320	35 6 58	2332	36 52 11	2344	38 37 7	2356
	Antares	E.	66 52 15	2391	65 8 27	2405	63 24 59	2420	61 41 53	2435
8	Sun	W.	89 18 22	2739	90 54 10	2752	92 29 41	2766	94 4 54	2779
	Regulus	W.	47 17 19	2418	49 0 28	2430	50 43 20	2443	52 25 54	2455
	Jupiter	W.	16 32 18	2456	18 14 33	2469	19 56 30	2481	21 38 10	2493
	Antares	E.	53 11 52	2516	51 31 1	2533	49 50 34	2551	48 10 32	2570
	α Aquilæ	E.	101 12 50	2896	99 40 29	2905	98 8 17	2914	96 36 16	2924
9	Sun	W.	101 56 40	2845	103 30 10	2858	105 3 23	2871	106 36 19	2883
	Regulus	W.	60 54 24	2516	62 35 15	2527	64 15 50	2540	65 56 8	2551
	Jupiter	W.	30 2 10	2555	31 42 7	2567	33 21 47	2580	35 1 10	2591
	Mars	W.	25 15 32	2704	26 52 6	2715	28 28 26	2726	30 4 31	2738
	Antares	E.	39 57 4	2675	38 19 50	2698	36 43 8	2725	35 7 1	2753
	α Aquilæ	E.	88 59 24	2980	87 28 46	2993	85 58 25	3007	84 28 21	3021
10	Sun	W.	114 16 59	2946	115 48 20	2958	117 19 25	2970	118 50 15	2981
	Regulus	W.	74 13 38	2609	75 52 21	2619	77 30 50	2630	79 9 4	2641
	Jupiter	W.	43 14 6	2649	44 51 54	2660	46 29 27	2672	48 6 45	2683
	Mars	W.	38 1 5	2796	39 35 38	2807	41 9 57	2818	42 44 2	2828
	Spica	W.	21 15 15	2758	22 50 38	2750	24 26 12	2745	26 1 52	2744
	α Aquilæ	E.	77 2 42	3103	75 34 36	3121	74 6 52	3141	72 39 32	3161
11	Sun	W.	126 20 48	3039	127 50 12	3051	129 19 22	3062	130 48 18	3073
	Regulus	W.	87 16 38	2692	88 53 28	2703	90 30 4	2713	92 6 27	2722
	Jupiter	W.	56 9 40	2735	57 45 33	2745	59 21 13	2755	60 56 40	2765
	Mars	W.	50 30 54	2882	52 3 36	2893	53 36 4	2903	55 8 19	2913
	Spica	W.	34 0 6	2756	35 35 32	2760	37 10 52	2766	38 46 4	2772
	α Aquilæ	E.	65 29 13	3276	64 4 33	3301	62 40 23	3329	61 16 45	3358
	Fomalhaut	E.	98 2 53	3014	96 32 57	3021	95 3 10	3029	93 33 33	3036

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
3	Sun	W.	28° 57′ 32″	2415	30° 40′ 45″	2413	32° 24′ 1″	2412	34° 7′ 18″	2413
	Jupiter	E.	47 52 48	2109	46 2 3	2113	44 11 23	2116	42 20 48	2119
	Mars	E.	50 29 10	2336	48 41 34	2337	46 54 2	2341	45 6 36	2346
	Spica	E.	71 26 2	2099	69 35 2	2103	67 44 7	2107	65 53 18	2111
4	Sun	W.	42 43 4	2430	44 25 56	2436	46 8 40	2442	47 51 15	2449
	Jupiter	E.	33 9 36	2147	31 19 49	2155	29 30 13	2162	27 40 48	2170
	Mars	E.	36 11 23	2277	34 24 49	2285	32 38 27	2294	30 52 18	2302
	Spica	E.	56 41 13	2143	54 51 20	2151	53 1 39	2161	51 12 12	2170
	Antares	E.	102 29 28	2178	100 40 27	2184	98 51 35	2190	97 2 53	2196
5	Sun	W.	56 21 25	2492	58 2 49	2503	59 43 59	2513	61 24 54	2524
	Mars	E.	22 5 12	2369	20 20 38	2378	18 36 23	2387	16 52 30	2405
	Spica	E.	42 8 50	2227	40 21 3	2241	38 33 37	2256	36 46 33	2272
	Antares	E.	88 2 25	2242	86 15 0	2253	84 27 51	2264	82 40 58	2274
6	Sun	W.	69 45 38	2582	71 24 58	2594	73 4 1	2607	74 42 46	2620
	Regulus	W.	26 16 33	2273	28 3 12	2285	29 49 34	2296	31 35 39	2308
	Spica	E.	27 57 28	2369	26 13 9	2394	24 29 26	2423	22 46 24	2456
	Antares	E.	73 50 48	2336	72 5 41	2349	70 20 53	2362	68 36 24	2376
7	Sun	W.	82 52 10	2685	84 29 10	2698	86 5 52	2712	87 42 16	2725
	Regulus	W.	40 21 45	2368	42 6 5	2381	43 50 7	2393	45 33 52	2405
	Antares	E.	59 59 8	2450	58 16 45	2467	56 34 45	2483	54 53 7	2499
8	Sun	W.	95 39 50	2792	97 14 28	2805	98 48 49	2818	100 22 53	2831
	Regulus	W.	54 8 11	2467	55 50 10	2480	57 31 52	2492	59 13 17	2504
	Jupiter	W.	23 19 33	2506	25 0 38	2518	26 41 26	2530	28 21 57	2543
	Antares	E.	46 30 56	2589	44 51 46	2609	43 13 3	2630	41 34 49	2652
	α Aquilæ	E.	95 4 27	2933	93 32 50	2944	92 1 27	2955	90 30 18	2967
9	Sun	W.	108 8 59	2896	109 41 23	2909	111 13 31	2921	112 45 23	2934
	Regulus	W.	67 36 10	2564	69 15 55	2574	70 55 25	2586	72 34 39	2597
	Jupiter	W.	36 40 17	2603	38 19 8	2615	39 57 43	2626	41 36 2	2638
	Mars	W.	31 40 20	2750	33 15 54	2761	34 51 13	2772	36 26 17	2785
	Antares	E.	33 31 31	2783	31 56 41	2816	30 22 34	2852	28 49 14	2894
	α Aquilæ	E.	82 58 34	3036	81 29 6	3052	79 59 58	3069	78 31 10	3085
10	Sun	W.	120 20 51	2993	121 51 12	3005	123 21 18	3017	124 51 10	3028
	Regulus	W.	80 47 3	2652	82 24 47	2662	84 2 18	2672	85 39 35	2683
	Jupiter	W.	49 43 49	2692	51 20 39	2704	52 57 14	2715	54 33 34	2725
	Mars	W.	44 17 53	2840	45 51 29	2851	47 24 51	2862	48 57 59	2872
	Spica	W.	27 37 34	2744	29 13 16	2744	30 48 57	2747	32 24 34	2751
	α Aquilæ	E.	71 12 36	3182	69 46 5	3204	68 20 0	3226	66 54 22	3251
11	Sun	W.	132 17 0	3084	133 45 29	3095	135 13 45	3106	136 41 47	3117
	Regulus	W.	93 42 38	2732	95 18 36	2741	96 54 21	2750	98 29 54	2760
	Jupiter	W.	62 31 54	2775	64 6 55	2785	65 41 43	2794	67 16 19	2803
	Mars	W.	56 40 21	2924	58 12 10	2933	59 43 47	2942	61 15 12	2953
	Spica	W.	40 21 8	2779	41 56 4	2785	43 30 51	2792	45 5 29	2798
	α Aquilæ	E.	59 53 40	3389	58 31 11	3421	57 9 18	3455	55 48 4	3492
	Fomalhaut	E.	92 4 7	3047	90 34 52	3056	89 5 48	3065	87 36 56	3075

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
12	Regulus	W.	100° 5′ 14″	2769	101° 40′ 23″	2778	103° 15′ 20″	2786	104° 50′ 6″	2795
	Jupiter	W.	68 50 43	2812	70 24 55	2821	71 58 55	2830	73 32 44	2839
	Mars	W.	62 46 24	2962	64 17 24	2971	65 48 13	2961	67 18 50	2969
	Spica	W.	46 39 59	2805	48 14 20	2813	49 48 31	2820	51 22 33	2827
	α Aquilæ	E.	54 27 31	3531	53 7 41	3572	51 48 36	3617	50 30 20	3664
	Fomalhaut	E.	86 8 16	3086	84 39 49	3096	83 11 34	3106	81 43 32	3118
13	Jupiter	W.	81 18 59	2881	82 51 42	2890	84 24 14	2898	85 56 36	2905
	Mars	W.	74 49 8	3034	76 18 39	3042	77 48 0	3050	79 17 11	3059
	Spica	W.	59 10 24	2863	60 43 30	2870	62 16 27	2877	63 49 15	2883
	α Aquilæ	E.	44 12 57	3965	43 0 43	4043	41 49 46	4128	40 40 11	4219
	Fomalhaut	E.	74 26 56	3179	73 0 22	3193	71 34 5	3208	70 8 5	3223
	α Pegasi	E.	89 7 39	3121	87 39 55	3129	86 12 21	3138	84 44 57	3147
14	Jupiter	W.	93 35 59	2943	95 7 23	2950	96 38 38	2958	98 9 44	2965
	Mars	W.	86 40 35	3098	88 8 47	3105	89 36 50	3113	91 4 44	3121
	Spica	W.	71 31 3	2919	73 2 58	2925	74 34 45	2932	76 6 23	2939
	Antares	W.	26 56 2	3202	28 22 9	3180	29 48 42	3163	31 15 36	3148
	Fomalhaut	E.	63 2 38	3306	61 38 34	3325	60 14 52	3345	58 51 32	3365
	α Pegasi	E.	77 30 53	3198	76 4 42	3209	74 38 44	3221	73 13 0	3232
15	Mars	W.	98 22 0	3156	99 49 2	3163	101 15 56	3169	102 42 42	3176
	Spica	W.	83 42 31	2970	85 13 21	2977	86 44 3	2983	88 14 37	2989
	Antares	W.	38 33 30	3109	40 1 29	3105	41 29 32	3103	42 57 38	3101
	Fomalhaut	E.	52 1 24	3493	50 40 52	3523	49 20 53	3555	48 1 29	3589
	α Pegasi	E.	66 8 0	3300	64 43 49	3315	63 19 55	3332	61 56 20	3348
16	Spica	W.	95 45 38	3018	97 15 29	3022	98 45 14	3028	100 14 52	3034
	Antares	W.	50 18 26	3101	51 46 35	3102	53 14 42	3103	54 42 48	3105
	Fomalhaut	E.	41 35 2	3813	40 20 13	3871	39 6 24	3934	37 53 39	4005
	α Pegasi	E.	55 3 31	3446	53 42 7	3469	52 21 8	3493	51 0 36	3519
	α Arietis	E.	97 26 46	3135	95 59 19	3140	94 31 58	3144	93 4 42	3149
17	Antares	W.	62 2 47	3114	63 30 40	3116	64 58 30	3118	66 26 18	3120
	α Pegasi	E.	44 25 52	3683	43 8 47	3724	41 52 25	3769	40 36 51	3819
	α Arietis	E.	85 49 48	3173	84 23 6	3178	82 56 30	3183	81 30 0	3187
18	Antares	W.	73 44 42	3129	75 12 16	3130	76 39 49	3131	78 7 21	3133
	α Aquilæ	W.	34 37 20	4967	35 34 41	4833	36 33 50	4714	37 34 38	4006
	α Arietis	E.	74 18 54	3211	72 52 58	3216	71 27 8	3220	70 1 23	3225
	Aldebaran	E.	106 30 33	3061	105 1 36	3064	103 32 42	3065	102 3 50	3067
19	Antares	W.	85 24 39	3136	86 52 5	3137	88 19 30	3137	89 46 55	3136
	α Aquilæ	W.	42 59 15	4206	44 7 35	4147	45 16 51	4093	46 26 59	4044
	α Arietis	E.	62 54 8	3251	61 28 59	3257	60 3 57	3262	58 39 1	3267
	Aldebaran	E.	94 40 0	3073	93 11 17	3073	91 42 34	3073	90 13 52	3073
	Sun	E.	143 7 37	3461	141 46 29	3460	140 25 20	3459	139 4 10	3457
20	Antares	W.	97 4 14	3131	98 31 46	3129	99 59 20	3127	101 26 57	3124
	α Aquilæ	W.	52 28 41	3847	53 42 55	3815	54 57 42	3786	56 12 59	3758
	α Arietis	E.	51 36 7	3300	50 11 56	3309	48 47 55	3318	47 24 4	3327
	Aldebaran	E.	82 50 8	3067	81 21 18	3065	79 52 25	3061	78 23 28	3059

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
12	Regulus	W.	106° 24′ 41″	2803	107° 59′ 5″	2811	109° 33′ 18″	2821	111° 7′ 19″	2829
	Jupiter	W.	75 6 21	2848	76 39 47	2856	78 13 2	2865	79 46 6	2873
	Mars	W.	68 49 16	2998	70 19 31	3008	71 49 34	3017	73 19 26	3025
	Spica	W.	52 56 26	2834	54 30 10	2842	56 3 44	2848	57 37 9	2856
	α Aquilæ	E.	49 12 55	3716	47 56 25	3770	46 40 52	3830	45 26 21	3896
	Fomalhaut	E.	80 15 44	3129	78 48 10	3141	77 20 50	3153	75 53 45	3167
13	Jupiter	W.	87 28 48	2913	89 0 50	2920	90 32 43	2928	92 4 26	2936
	Mars	W.	80 46 11	3067	82 15 1	3074	83 43 42	3082	85 12 13	3090
	Spica	W.	65 21 55	2891	66 54 26	2898	68 26 47	2905	69 58 59	2912
	α Aquilæ	E.	39 32 3	4391	38 25 30	4434	37 20 39	4558	36 17 38	4696
	Fomalhaut	E.	68 42 22	3937	67 16 57	3953	65 51 51	3970	64 27 4	3988
	α Pegasi	E.	83 17 44	3157	81 50 43	3167	80 23 54	3177	78 57 17	3188
14	Jupiter	W.	99 40 40	2972	101 11 28	2978	102 42 8	2985	104 12 39	2992
	Mars	W.	92 32 28	3129	94 0 3	3135	95 27 30	3142	96 54 49	3148
	Spica	W.	77 37 53	2945	79 9 15	2952	80 40 28	2958	82 11 33	2964
	Antares	W.	32 42 48	3136	34 10 14	3127	35 37 51	3119	37 5 37	3114
	Fomalhaut	E.	57 28 36	3388	56 6 6	3412	54 44 3	3437	53 22 28	3464
	α Pegasi	E.	71 47 29	3945	70 22 13	3959	68 57 13	3971	67 32 28	3986
15	Mars	W.	104 9 20	3182	105 35 51	3188	107 2 14	3195	108 28 29	3201
	Spica	W.	89 45 4	2995	91 15 23	3001	92 45 35	3006	94 15 40	3012
	Antares	W.	44 25 46	3100	45 53 56	3100	47 22 6	3100	48 50 16	3100
	Fomalhaut	E.	46 42 43	3627	45 24 38	3669	44 7 18	3713	42 50 45	3761
	α Pegasi	E.	60 33 4	3365	59 10 8	3384	57 47 33	3403	56 25 20	3424
16	Spica	W.	101 44 23	3039	103 13 48	3043	104 43 7	3048	106 12 20	3054
	Antares	W.	56 10 52	3106	57 38 54	3108	59 6 54	3110	60 34 52	3112
	Fomalhaut	E.	36 42 4	4082	35 31 45	4168	34 22 49	4265	33 15 24	4374
	α Pegasi	E.	49 40 33	3547	48 21 1	3577	47 2 2	3610	45 43 38	3645
	α Arietis	E.	91 37 32	3154	90 10 28	3158	88 43 29	3163	87 16 36	3168
17	Antares	W.	67 54 3	3192	69 21 46	3194	70 49 27	3195	72 17 6	3198
	α Pegasi	E.	39 22 8	3873	38 8 21	3933	36 55 35	4000	35 43 55	4074
	α Arietis	E.	80 3 35	3192	78 37 16	3197	77 11 3	3202	75 44 56	3206
18	Antares	W.	79 34 51	3133	81 2 20	3135	82 29 47	3136	83 57 13	3136
	α Aquilæ	W.	38 36 58	4509	39 40 42	4422	40 45 43	4343	41 51 56	4271
	α Arietis	E.	68 35 44	3231	67 10 11	3236	65 44 44	3241	64 19 23	3246
	Aldebaran	E.	100 35 0	3069	99 6 13	3071	97 37 28	3072	96 8 44	3072
19	Antares	W.	91 14 21	3136	92 41 47	3135	94 9 14	3133	95 36 43	3132
	α Aquilæ	W.	47 37 55	3999	48 49 36	3956	50 1 59	3917	51 15 2	3881
	α Arietis	E.	57 14 11	3273	55 49 28	3280	54 24 53	3287	53 0 26	3294
	Aldebaran	E.	88 45 10	3073	87 16 27	3071	85 47 42	3070	84 18 56	3069
	Sun	E.	137 42 58	3455	136 21 44	3454	135 0 28	3451	133 39 9	3448
20	Antares	W.	102 54 37	3122	104 22 20	3119	105 50 6	3117	107 17 55	3113
	α Aquilæ	W.	57 28 45	3732	58 44 58	3707	60 1 38	3683	61 18 43	3661
	α Arietis	E.	46 0 24	3338	44 36 56	3349	43 13 41	3362	41 50 41	3377
	Aldebaran	E.	76 54 28	3056	75 25 24	3052	73 56 15	3047	72 27 1	3043

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
20	Venus	E.	98° 23′ 10″	3533	97° 3′ 22″	3530	95° 43′ 31″	3527	94° 23′ 37″	3524
	Sun	E.	132 17 47	3445	130 56 21	3442	129 34 52	3439	128 13 20	3436
21	α Aquilæ	W.	62 36 12	3639	63 54 4	3619	65 12 18	3599	66 30 53	3580
	α Arietis	E.	40 27 58	3393	39 5 35	3410	37 43 30	3431	36 21 49	3455
	Aldebaran	E.	70 57 41	3038	69 28 15	3033	67 58 43	3027	66 29 4	3021
	Venus	E.	87 43 3	3501	86 22 40	3496	85 2 11	3489	83 41 35	3483
	Sun	E.	121 24 26	3411	120 2 22	3404	118 40 10	3398	117 17 51	3391
22	α Aquilæ	W.	73 8 48	3494	74 29 19	3478	75 50 8	3462	77 11 15	3446
	Fomalhaut	W.	40 17 45	3803	41 32 44	3746	42 48 42	3694	44 5 35	3646
	Aldebaran	E.	58 58 43	2984	57 28 10	2976	55 57 27	2967	54 26 33	2957
	Venus	E.	76 56 35	3443	75 35 7	3433	74 13 28	3424	72 51 39	3414
	Saturn	E.	95 13 36	3040	93 44 13	3031	92 14 39	3022	90 44 53	3012
	Sun	E.	110 24 8	3350	109 0 54	3340	107 37 29	3331	106 13 53	3320
23	α Aquilæ	W.	84 1 2	3373	85 23 49	3359	86 46 52	3346	88 10 10	3332
	Fomalhaut	W.	50 42 1	3446	52 3 26	3411	53 25 30	3379	54 48 11	3348
	α Pegasi	W.	36 54 15	3785	38 9 33	3715	39 26 4	3650	40 43 44	3590
	Aldebaran	E.	46 48 53	2904	45 16 39	2892	43 44 10	2880	42 11 26	2867
	Venus	E.	65 59 29	3356	64 36 22	3344	63 13 1	3330	61 49 24	3317
	Saturn	E.	83 12 57	2958	81 41 52	2946	80 10 32	2935	78 38 57	2922
	Sun	E.	99 12 42	3262	97 47 46	3248	96 22 34	3235	94 57 6	3222
24	Fomalhaut	W.	61 50 13	3205	63 16 16	3179	64 42 50	3154	66 9 54	3130
	α Pegasi	W.	47 27 4	3346	48 50 22	3306	50 14 27	3267	51 39 17	3231
	Aldebaran	E.	34 23 29	2798	32 48 59	2784	31 14 10	2769	29 39 1	2753
	Venus	E.	54 47 15	3243	53 21 57	3227	51 56 20	3211	50 30 24	3194
	Saturn	E.	70 56 50	2852	69 23 30	2838	67 49 51	2823	66 15 53	2806
	Sun	E.	87 45 35	3147	86 18 22	3130	84 50 49	3114	83 22 56	3097
25	Fomalhaut	W.	73 32 35	3011	75 2 34	2989	76 33 0	2967	78 3 54	2946
	α Pegasi	W.	58 53 52	3065	60 22 44	3035	61 52 13	3006	63 22 18	2979
	Venus	E.	43 15 41	3109	41 47 42	3091	40 19 21	3073	38 50 39	3056
	Saturn	E.	58 20 53	2726	56 44 48	2709	55 8 20	2692	53 31 30	2675
	Sun	E.	75 58 16	3009	74 28 14	2989	72 57 48	2971	71 26 59	2952
26	Fomalhaut	W.	85 45 6	2849	87 18 39	2823	88 52 37	2805	90 26 59	2786
	α Pegasi	W.	71 1 14	2848	72 34 40	2824	74 8 37	2800	75 43 5	2776
	α Arietis	W.	27 58 13	3205	29 24 16	3119	30 52 3	3043	32 21 23	2975
	Venus	E.	31 21 39	2968	29 50 46	2950	28 19 31	2935	26 47 56	2920
	Saturn	E.	45 21 25	2588	43 42 13	2569	42 2 36	2552	40 22 35	2535
	Sun	E.	63 46 48	2855	62 13 31	2835	60 39 48	2815	59 5 39	2795
27	Fomalhaut	W.	98 24 41	2701	100 1 19	2687	101 38 17	2672	103 15 34	2660
	α Pegasi	W.	83 42 52	2669	85 20 14	2649	86 58 2	2630	88 36 16	2611
	α Arietis	W.	40 7 1	2716	41 43 19	2675	43 20 32	2637	44 58 36	2602
	Sun	E.	51 8 27	2696	49 31 42	2677	47 54 31	2658	46 16 55	2639
28	α Pegasi	W.	96 53 26	2530	98 33 57	2517	100 14 47	2504	101 55 54	2492
	α Arietis	W.	53 20 14	2452	55 2 35	2426	56 45 33	2402	58 29 5	2378
	Sun	E.	38 2 35	2549	36 22 30	2533	34 42 2	2517	33 1 12	2501

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
20	**Venus**	E.	93° 3′ 39″	3520	91° 43′ 37″	3516	90° 23′ 31″	3512	89° 3′ 20″	3506
	Sun	E.	126 51 44	3431	125 30 3	3426	124 8 16	3422	122 46 24	3416
21	**α Aquilæ**	W.	67 49 49	3562	69 9 5	3545	70 28 40	3528	71 48 35	3510
	α Arietis	E.	35 0 33	3482	33 39 49	3514	32 19 40	3551	31 0 12	3593
	Aldebaran	E.	64 59 17	3014	63 29 22	3007	61 59 18	3000	60 29 5	2993
	Venus	E.	82 20 52	3476	81 0 1	3468	79 39 1	3461	78 17 53	3452
	Sun	E.	115 55 24	3383	114 32 48	3376	113 10 4	3368	111 47 11	3359
22	**α Aquilæ**	W.	78 32 39	3431	79 54 20	3417	81 16 17	3402	82 38 31	3387
	Fomalhaut	W.	45 23 20	3600	46 41 54	3559	48 1 13	3519	49 21 16	3481
	Aldebaran	E.	52 55 27	2947	51 24 8	2938	49 52 37	2927	48 20 52	2916
	Venus	E.	71 29 38	3403	70 7 25	3392	68 44 59	3381	67 22 21	3369
	Saturn	E.	89 14 55	3002	87 44 45	2993	86 14 23	2981	84 43 47	2970
	Sun	E.	104 50 5	3309	103 26 4	3298	102 1 50	3287	100 37 23	3275
23	**α Aquilæ**	W.	89 33 44	3319	90 57 33	3306	92 21 37	3294	93 45 56	3282
	Fomalhaut	W.	56 11 27	3318	57 35 18	3288	58 59 43	3259	60 24 42	3232
	α Pegasi	W.	42 2 29	3535	43 22 15	3483	44 42 58	3435	46 4 35	3389
	Aldebaran	E.	40 38 25	2855	39 5 8	2841	37 31 33	2827	35 57 40	2813
	Venus	E.	60 25 32	3303	59 1 24	3288	57 36 59	3273	56 12 16	3258
	Saturn	E.	77 7 6	2909	75 34 58	2895	74 2 33	2882	72 29 51	2867
	Sun	E.	93 31 23	3208	92 5 23	3193	90 39 5	3178	89 12 29	3163
24	**Fomalhaut**	W.	67 37 27	3105	69 5 30	3081	70 34 3	3057	72 3 5	3034
	α Pegasi	W.	53 4 50	3195	54 31 5	3161	55 58 1	3128	57 25 37	3096
	Aldebaran	E.	28 3 31	2737	26 27 40	2721	24 51 28	2704	23 14 54	2688
	Venus	E.	49 4 8	3178	47 37 32	3161	46 10 36	3143	44 43 19	3126
	Saturn	E.	64 41 35	2792	63 6 57	2775	61 31 57	2760	59 56 36	2743
	Sun	E.	81 54 43	3080	80 26 9	3062	78 57 13	3045	77 27 56	3026
25	**Fomalhaut**	W.	79 35 15	2924	81 7 3	2903	82 39 18	2883	84 11 59	2862
	α Pegasi	W.	64 52 57	2951	66 24 11	2924	67 55 59	2898	69 28 20	2873
	Venus	E.	37 21 35	3038	35 52 9	3020	34 22 21	3002	32 52 11	2985
	Saturn	E.	51 54 16	2657	50 16 39	2640	48 38 38	2622	47 0 13	2605
	Sun	E.	69 55 46	2933	68 24 9	2913	66 52 7	2894	65 19 40	2874
26	**Fomalhaut**	W.	92 1 45	2768	93 36 55	2750	95 12 28	2733	96 48 24	2717
	α Pegasi	W.	77 18 4	2753	78 53 33	2732	80 29 31	2710	82 5 58	2689
	α Arietis	W.	33 52 7	2914	35 24 8	2858	36 57 21	2807	38 31 40	2760
	Venus	E.	25 16 2	2905	23 43 49	2891	22 11 19	2881	20 38 36	2873
	Saturn	E.	38 42 11	2518	37 1 23	2501	35 20 11	2485	33 38 36	2469
	Sun	E.	57 31 5	2775	55 56 5	2756	54 20 39	2735	52 44 46	2716
27	**Fomalhaut**	W.	104 53 8	2647	106 30 59	2635	108 9 6	2626	109 47 26	2616
	α Pegasi	W.	90 14 56	2593	91 54 0	2577	93 33 27	2561	95 13 16	2545
	α Arietis	W.	46 37 28	2569	48 17 6	2537	49 57 28	2507	51 38 31	2479
	Sun	E.	44 38 53	2620	43 0 25	2602	41 21 33	2584	39 42 16	2566
28	**α Pegasi**	W.	103 37 18	2482	105 18 57	2472	107 0 49	2465	108 42 52	2458
	α Arietis	W.	60 13 11	2356	61 57 49	2335	63 42 57	2316	65 28 33	2298
	Sun	E.	31 20 0	2487	29 38 28	2472	27 56 36	2459	26 14 25	2447

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.		Subtracted from Apparent Time.	
		h m s	s	° ′ ″	″	′ ″	s	m s	s
SUN.	1	8 46 10.05	9.711	N. 17 59 17.5	-37.90	15 48.05	66.64	6 4.83	0.145
Mon.	2	8 50 2.79	9.685	17 43 59.2	38.63	15 48.18	66.55	6 1.03	0.171
Tues.	3	8 53 54.91	9.660	17 28 23.6	39.34	15 48.32	66.46	5 56.61	0.196
Wed.	4	8 57 46.42	9.634	17 12 31.0	-40.04	15 48.46	66.37	5 51.57	0.222
Thur.	5	9 1 37.31	9.609	16 56 21.6	40.73	15 48.61	66.28	5 45.92	0.247
Frid.	6	9 5 27.58	9.583	16 39 55.8	41.41	15 48.76	66.20	5 39.66	0.273
Sat.	7	9 9 17.25	9.557	16 23 13.9	-42.08	15 48.91	66.11	5 32.79	0.298
SUN.	8	9 13 6.31	9.532	16 6 16.3	42.73	15 49.07	66.03	5 25.31	0.323
Mon.	9	9 16 54.77	9.507	15 49 3.1	43.37	15 49.23	65.94	5 17.23	0.348
Tues.	10	9 20 42.62	9.482	15 31 34.8	-43.99	15 49.39	65.86	5 8.55	0.373
Wed.	11	9 24 29.89	9.458	15 13 51.6	44.61	15 49.56	65.78	4 59.29	0.398
Thur.	12	9 28 16.58	9.434	14 55 53.9	45.21	15 49.73	65.70	4 49.46	0.421
Frid.	13	9 32 2.71	9.411	14 37 41.9	-45.80	15 49.90	65.62	4 39.06	0.444
Sat.	14	9 35 48.28	9.388	14 19 15.7	46.38	15 50.08	65.54	4 28.11	0.467
SUN.	15	9 39 33.31	9.366	14 0 36.0	46.94	15 50.26	65.46	4 16.61	0.489
Mon.	16	9 43 17.82	9.344	13 41 42.9	-47.49	15 50.44	65.39	4 4.60	0.511
Tues.	17	9 47 1.81	9.323	13 22 36.7	48.02	15 50.62	65.31	3 52.08	0.532
Wed.	18	9 50 45.30	9.302	13 3 17.7	48.55	15 50.81	65.24	3 39.05	0.553
Thur.	19	9 54 28.30	9.282	12 43 46.2	-49.06	15 51.00	65.16	3 25.54	0.573
Frid.	20	9 58 10.84	9.264	12 24 2.7	49.56	15 51.18	65.09	3 11.56	0.591
Sat.	21	10 1 52.93	9.245	12 4 7.3	50.05	15 51.37	65.02	2 57.13	0.610
SUN.	22	10 5 34.58	9.226	11 44 0.3	-50.52	15 51.57	64.96	2 42.26	0.628
Mon.	23	10 9 15.79	9.208	11 23 42.1	50.98	15 51.77	64.89	2 26.96	0.646
Tues.	24	10 12 56.59	9.191	11 3 13.0	51.43	15 51.97	64.83	2 11.25	0.663
Wed.	25	10 16 36.98	9.175	10 42 33.3	-51.87	15 52.17	64.77	1 55.13	0.679
Thur.	26	10 20 16.98	9.159	10 21 43.3	52.29	15 52.38	64.71	1 38.62	0.695
Frid.	27	10 23 56.60	9.143	10 0 43.3	52.70	15 52.59	64.65	1 21.74	0.711
Sat.	28	10 27 35.85	9.128	9 39 33.9	-53.09	15 52.81	64.60	1 4.49	0.726
SUN.	29	10 31 14.75	9.113	9 18 15.2	53.47	15 53.03	64.55	0 46.89	0.741
Mon.	30	10 34 53.31	9.100	8 56 47.6	53.83	15 53.26	64.50	0 28.95	0.754
Tues.	31	10 38 31.54	9.086	8 35 11.2	54.18	15 53.49	64.45	0 10.67	0.768
Wed.	32	10 42 9.45	9.073	N. 8 13 26.7	-54.52	15 53.72	64.41	0 7.93	0.781

Note.—The mean time of semidiameter passing may be found by subtracting $0^{s}.18$ from the sidereal time.
The sign – prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from / Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
SUN.	1	8 46 9.07	9.711	N. 17 59 21.4	–37.90	6 4.84	0.145	8 40 4.23
Mon.	2	8 50 1.82	9.685	17 44 3.1	38.63	6 1.04	0.171	8 44 0.78
Tues.	3	8 53 53.96	9.660	17 28 27.5	39.34	5 56.62	0.196	8 47 57.34
Wed.	4	8 57 45.48	9.634	17 12 34.9	–40.04	5 51.59	0.222	8 51 53.89
Thur.	5	9 1 36.39	9.609	16 56 25.5	40.73	5 45.94	0.247	8 55 50.45
Frid.	6	9 5 26.68	9.583	16 39 59.7	41.41	5 39.68	0.273	8 59 47.00
Sat.	7	9 9 16.37	9.558	16 23 17.8	–42.08	5 32.81	0.298	9 3 43.56
SUN.	8	9 13 5.45	9.533	16 6 20.1	42.73	5 25.34	0.323	9 7 40.11
Mon.	9	9 16 53.93	9.508	15 49 6.9	43.37	5 17.26	0.348	9 11 36.67
Tues.	10	9 20 41.81	9.483	15 31 38.5	–43.99	5 8.58	0.373	9 15 33.22
Wed.	11	9 24 29.10	9.459	15 13 55.3	44.61	4 59.32	0.398	9 19 29.78
Thur.	12	9 28 15.82	9.435	14 55 57.5	45.21	4 49.49	0.421	9 23 26.33
Frid.	13	9 32 1.98	9.412	14 37 45.3	–45.80	4 39.09	0.444	9 27 22.89
Sat.	14	9 35 47.58	9.389	14 19 19.1	46.38	4 28.14	0.467	9 31 19.44
SUN.	15	9 39 32.64	9.367	14 0 39.3	46.94	4 16.64	0.489	9 35 16.00
Mon.	16	9 43 17.18	9.345	13 41 46.1	–47.49	4 4.63	0.511	9 39 12.55
Tues.	17	9 47 1.21	9.324	13 22 39.8	48.03	3 52.11	0.532	9 43 9.10
Wed.	18	9 50 44.73	9.303	13 3 20.7	48.56	3 39.08	0.553	9 47 5.65
Thur.	19	9 54 27.77	9.283	12 43 49.1	–49.07	3 25.57	0.573	9 51 2.21
Frid.	20	9 58 10.35	9.265	12 24 5.4	49.57	3 11.59	0.591	9 54 58.76
Sat.	21	10 1 52.48	9.246	12 4 9.8	50.06	2 57.16	0.610	9 58 55.32
SUN.	22	10 5 34.16	9.228	11 44 2.6	–50.53	2 42.29	0.628	10 2 51.87
Mon.	23	10 9 15.41	9.210	11 23 44.2	50.99	2 26.99	0.646	10 6 48.42
Tues.	24	10 12 56.25	9.193	11 3 14.9	51.44	2 11.27	0.663	10 10 44.97
Wed.	25	10 16 36.68	9.177	10 42 35.0	–51.88	1 55.15	0.679	10 14 41.53
Thur.	26	10 20 16.72	9.161	10 21 44.8	52.30	1 38.64	0.695	10 18 38.08
Frid.	27	10 23 56.39	9.145	10 0 44.6	52.71	1 21.76	0.711	10 22 34.63
Sat.	28	10 27 35.69	9.130	9 39 34.9	–53.10	1 4.51	0.726	10 26 31.18
SUN.	29	10 31 14.63	9.115	9 18 16.0	53.48	0 46.90	0.741	10 30 27.74
Mon.	30	10 34 53.24	9.102	8 56 48.1	53.84	0 28.95	0.754	10 34 24.29
Tues.	31	10 38 31.51	9.088	8 35 11.5	54.19	0 10.67	0.768	10 38 20.84
Wed.	32	10 42 9.46	9.075	N. 8 13 26.7	–54.53	0 7.93	0.781	10 42 17.39

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign – prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour,
$+ 9^{s}.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	218	129 6 25.9	6 1.9	143.63	+ 0.05	0.0063453	- 24.6	15 17 25.07
2	214	130 3 53.4	3 29.3	143.66	0.19	0.0062851	25.6	15 13 29.16
3	215	131 1 21.8	0 57.5	143.70	0.33	0.0062225	26.5	15 9 33.25
4	216	131 58 50.9	58 26.5	143.73	+ 0.47	0.0061577	- 27.4	15 5 37.34
5	217	132 56 20.8	55 56.3	143.77	0.58	0.0060907	28.3	15 1 41.43
6	218	133 53 51.5	53 26.9	143.80	0.67	0.0060216	29.2	14 57 45.52
7	219	134 51 23.0	50 58.3	143.84	+ 0.74	0.0059507	- 29.9	14 53 49.61
8	220	135 48 55.4	48 30.5	143.87	0.78	0.0058781	30.5	14 49 53.70
9	221	136 46 28.6	46 3.6	143.91	0.79	0.0058040	31.1	14 45 57.79
10	222	137 44 2.6	43 37.5	143.94	+ 0.76	0.0057285	- 31.6	14 42 1.88
11	223	138 41 37.6	41 12.4	143.98	0.71	0.0056516	32.1	14 38 5.97
12	224	139 39 13.7	38 48.3	144.02	0.63	0.0055735	32.6	14 34 10.06
13	225	140 36 50.8	36 25.3	144.07	+ 0.53	0.0054943	- 33.1	14 30 14.15
14	226	141 34 29.0	34 3.4	144.12	0.41	0.0054140	33.6	14 26 18.24
15	227	142 32 8.5	31 42.8	144.17	0.28	0.0053328	34.0	14 22 22.34
16	228	143 29 49.4	29 23.6	144.23	+ 0.15	0.0052506	- 34.4	14 18 26.43
17	229	144 27 31.8	27 5.8	144.29	+ 0.02	0.0051674	34.8	14 14 30.52
18	230	145 25 15.6	24 49.5	144.35	— 0.10	0.0050832	35.3	14 10 34.62
19	231	146 23 0.9	22 34.7	144.42	— 0.20	0.0049980	- 35.7	14 6 38.71
20	232	147 20 47.9	20 21.6	144.49	0.27	0.0049116	36.2	14 2 42.81
21	233	148 18 36.6	18 10.2	144.56	0.32	0.0048240	36.7	13 58 46.90
22	234	149 16 27.0	16 0.5	144.63	— 0.34	0.0047351	- 37.3	13 54 50.99
23	235	150 14 19.2	13 52.6	144.71	0.33	0.0046448	37.9	13 50 55.09
24	236	151 12 13.2	11 46.5	144.78	0.29	0.0045530	38.6	13 46 59.18
25	237	152 10 8.9	9 42.1	144.86	— 0.23	0.0044596	- 39.3	13 43 3.27
26	238	153 8 6.3	7 39.4	144.93	0.14	0.0043645	40.0	13 39 7.37
27	239	154 6 5.5	5 38.5	145.01	— 0.02	0.0042676	40.8	13 35 11.46
28	240	155 4 6.5	3 39.4	145.08	+ 0.12	0.0041688	- 41.6	13 31 15.55
29	241	156 2 9.3	1 42.1	145.15	0.25	0.0040681	42.4	13 27 19.64
30	242	156 60 13.7	59 46.4	145.21	0.38	0.0039656	43.1	13 23 23.74
31	243	157 58 19.6	57 52.2	145.28	0.51	0.0038613	43.9	13 19 27.83
32	244	158 56 27.1	55 59.6	145.34	+ 0.63	0.0037554	- 44.6	13 15 31.92

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0d.0.

Diff. for 1 Hour,
— 9s.8296.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 41.7	16 39.7	61 9.6	–0.43	61 2.2	–0.80	1 19.1	2.42	1.3
2	16 36.5	16 32.3	60 50.5	1.13	60 35.0	1.43	2 16.0	2.32	2.3
3	16 27.1	16 21.3	60 16.2	1.68	59 54.8	1.87	3 10.5	2.23	3.3
4	16 14.9	16 8.2	59 31.4	–2.01	59 6.7	–2.10	4 3.1	2.16	4.3
5	16 1.3	15 54.3	58 41.2	2.14	58 15.4	2.14	4 54.4	2.12	5.3
6	15 47.3	15 40.6	57 49.9	2.10	57 25.1	2.03	5 45.0	2.10	6.3
7	15 34.1	15 27.9	57 1.2	–1.94	56 38.5	–1.83	6 35.2	2.10	7.3
8	15 22.1	15 16.7	56 17.2	1.71	55 57.5	1.58	7 25.3	2.09	8.3
9	15 11.8	15 7.2	55 39.3	1.45	55 22.7	1.32	8 15.3	2.08	9.3
10	15 3.2	14 59.5	55 7.7	–1.18	54 54.3	–1.05	9 4.9	2.05	10.3
11	14 56.3	14 53.5	54 42.5	0.92	54 32.2	0.80	9 53.8	2.01	11.3
12	14 51.1	14 49.0	54 23.3	0.68	54 15.8	0.57	10 41.6	1.96	12.3
13	14 47.3	14 46.0	54 9.6	–0.46	54 4.8	–0.35	11 28.0	1.90	13.3
14	14 45.1	14 44.5	54 1.3	0.24	53 59.1	–0.13	12 13.0	1.85	14.3
15	14 44.2	14 44.4	53 58.2	–0.02	53 58.7	+0.10	12 56.9	1.80	15.3
16	14 44.9	14 45.8	54 0.5	+0.21	54 3.8	+0.34	13 39.8	1.78	16.3
17	14 47.1	14 48.8	54 8.6	0.47	54 15.0	0.61	14 22.3	1.77	17.3
18	14 51.0	14 53.7	54 23.2	0.75	54 33.0	0.90	15 5.1	1.79	18.3
19	14 56.9	15 0.6	54 44.7	+1.06	54 58.3	+1.22	15 48.7	1.85	19.3
20	15 4.8	15 9.6	55 13.9	1.38	55 31.4	1.54	16 33.9	1.93	20.3
21	15 14.9	15 20.7	55 50.8	1.70	56 12.2	1.86	17 21.3	2.04	21.3
22	15 27.0	15 33.7	56 35.3	+1.99	57 0.0	+2.11	18 11.7	2.17	22.3
23	15 40.8	15 48.2	57 26.0	2.21	57 53.1	2.29	19 5.2	2.30	23.3
24	15 55.7	16 3.3	58 20.8	2.31	58 48.6	2.30	20 1.6	2.41	24.3
25	16 10.8	16 17.9	59 16.0	+2.24	59 42.4	+2.13	21 0.4	2.48	25.3
26	16 24.6	16 30.7	60 7.0	1.95	60 29.2	1.72	22 0.3	2.50	26.3
27	16 35.9	16 40 0	60 48.2	1.43	61 3.5	1.09	23 0.0	2.47	27.3
28	16 43.0	16 44.7	61 14.4	+0.71	61 20.6	+0.31	23 58.5	2.40	28.3
29	16 45.0	16 44.0	61 21.8	–0.11	61 18.0	–0.53	☌		29.3
30	16 41.6	16 38.0	61 9.2	0.92	60 55.9	1.29	0 55.3	2.33	1.0
31	16 33.2	16 27.4	60 38.3	1.61	60 17.3	1.88	1 50.4	2.26	2.0
32	16 20.9	16 13.8	59 53.3	–2.09	59 27.2	–2.24	2 44.1	2.21	3.0

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 56 7.31	2.4930	N. 11 35 22.1	9.680
1	9 58 36.78	2.4894	11 25 39.0	9.757
2	10 1 6.03	2.4858	11 15 51.3	9.832
3	10 3 35.07	2.4822	11 5 59.2	9.905
4	10 6 3.89	2.4785	10 56 2.7	9.977
5	10 8 32.49	2.4748	10 46 1.9	10.047
6	10 11 0.87	2.4712	10 35 57.0	10.116
7	10 13 29.03	2.4676	10 25 48.0	10.184
8	10 15 56.98	2.4640	10 15 34.9	10.251
9	10 18 24.71	2.4603	10 5 17.9	10.315
10	10 20 52.22	2.4566	9 54 57.1	10.377
11	10 23 19.50	2.4528	9 44 32.6	10.438
12	10 25 46.55	2.4490	9 34 4.5	10.498
13	10 28 13.38	2.4453	9 23 32.8	10.557
14	10 30 39.99	2.4417	9 12 57.7	10.613
15	10 33 6.38	2.4380	9 2 19.2	10.669
16	10 35 32.55	2.4342	8 51 37.4	10.722
17	10 37 58.49	2.4305	8 40 52.5	10.773
18	10 40 24.21	2.4268	8 30 4.6	10.823
19	10 42 49.71	2.4231	8 19 13.7	10.873
20	10 45 14.98	2.4193	8 8 19.8	10.922
21	10 47 40.03	2.4157	7 57 23.1	10.968
22	10 50 4.86	2.4120	7 46 23.7	11.012
23	10 52 29.47	2.4082	N. 7 35 21.7	11.054

MONDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 54 53.85	2.4045	N. 7 24 17.2	11.095
1	10 57 18.01	2.4009	7 13 10.3	11.135
2	10 59 41.96	2.3973	7 2 1.0	11.174
3	11 2 5.69	2.3937	6 50 49.4	11.212
4	11 4 29.20	2.3901	6 39 35.6	11.247
5	11 6 52.50	2.3865	6 28 19.8	11.279
6	11 9 15.58	2.3829	6 17 2.1	11.311
7	11 11 38.45	2.3793	6 5 42.5	11.342
8	11 14 1.10	2.3757	5 54 21.0	11.372
9	11 16 23.54	2.3722	5 42 57.8	11.400
10	11 18 45.77	2.3687	5 31 33.0	11.427
11	11 21 7.79	2.3653	5 20 6.6	11.452
12	11 23 29.61	2.3619	5 8 38.8	11.474
13	11 25 51.22	2.3584	4 57 9.7	11.496
14	11 28 12.62	2.3549	4 45 39.3	11.517
15	11 30 33.81	2.3515	4 34 7.7	11.536
16	11 32 54.80	2.3482	4 22 35.0	11.553
17	11 35 15.60	2.3450	4 11 1.3	11.569
18	11 37 36.20	2.3417	3 59 26.7	11.584
19	11 39 56.60	2.3384	3 47 51.2	11.597
20	11 42 16.81	2.3352	3 36 15.0	11.609
21	11 44 36.82	2.3319	3 24 38.1	11.619
22	11 46 56.64	2.3287	3 13 0.7	11.628
23	11 49 16.27	2.3256	3 1 22.7	11.637
24	11 51 35.71	2.3225	N. 2 49 44.3	11.642

TUESDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 51 35.71	2.3225	N. 2 49 44.3	11.642
1	11 53 54.97	2.3194	2 38 5.6	11.647
2	11 56 14.04	2.3163	2 26 26.6	11.651
3	11 58 32.93	2.3133	2 14 47.5	11.653
4	12 0 51.64	2.3103	2 3 8.3	11.654
5	12 3 10.17	2.3074	1 51 29.0	11.654
6	12 5 28.53	2.3045	1 39 49.8	11.652
7	12 7 46.71	2.3016	1 28 10.7	11.649
8	12 10 4.72	2.2988	1 16 31.9	11.644
9	12 12 22.57	2.2961	1 4 53.4	11.639
10	12 14 40.25	2.2933	0 53 15.2	11.632
11	12 16 57.76	2.2905	0 41 37.5	11.624
12	12 19 15.11	2.2878	0 30 0.3	11.615
13	12 21 32.30	2.2852	0 18 23.7	11.604
14	12 23 49.33	2.2825	N. 0 6 47.8	11.592
15	12 26 6.20	2.2799	S. 0 4 47.3	11.578
16	12 28 22.92	2.2774	0 16 21.6	11.564
17	12 30 39.49	2.2749	0 27 55.0	11.549
18	12 32 55.91	2.2724	0 39 27.5	11.532
19	12 35 12.18	2.2700	0 50 58.9	11.514
20	12 37 28.31	2.2677	1 2 29.2	11.496
21	12 39 44.30	2.2653	1 13 58.4	11.476
22	12 42 0.15	2.2630	1 25 26.3	11.454
23	12 44 15.86	2.2607	S. 1 36 52.8	11.431

WEDNESDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 46 31.43	2.2584	S. 1 48 18.0	11.408
1	12 48 46.87	2.2562	1 59 41.8	11.383
2	12 51 2.18	2.2541	2 11 4.0	11.357
3	12 53 17.36	2.2520	2 22 24.6	11.329
4	12 55 32.42	2.2499	2 33 43.5	11.301
5	12 57 47.35	2.2478	2 45 0.8	11.273
6	13 0 2.16	2.2458	2 56 16.3	11.243
7	13 2 16.85	2.2438	3 7 29.9	11.212
8	13 4 31.42	2.2419	3 18 41.7	11.180
9	13 6 45.88	2.2401	3 29 51.5	11.146
10	13 9 0.23	2.2382	3 40 59.2	11.112
11	13 11 14.47	2.2364	3 52 4.9	11.077
12	13 13 28.60	2.2347	4 3 8.4	11.040
13	13 15 42.63	2.2329	4 14 9.7	11.003
14	13 17 56.55	2.2312	4 25 8.8	10.965
15	13 20 10.37	2.2296	4 36 5.5	10.925
16	13 22 24.10	2.2280	4 46 59.8	10.885
17	13 24 37.73	2.2263	4 57 51.7	10.844
18	13 26 51.26	2.2247	5 8 41.1	10.802
19	13 29 4.70	2.2232	5 19 27.9	10.759
20	13 31 18.05	2.2218	5 30 12.2	10.716
21	13 33 31.32	2.2204	5 40 53.8	10.670
22	13 35 44.50	2.2190	5 51 32.6	10.624
23	13 37 57.60	2.2177	6 2 8.7	10.578
24	13 40 10.62	2.2163	S. 6 12 42.0	10.531

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 5.					**SATURDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 40 10.62	2.2163	S. 6 12 42.0	10.531	0	15 25 36.06	2.1854	S. 13 29 7.5	7.404
1	13 42 23.56	2.2150	6 23 12.4	10.482	1	15 27 47.18	2.1853	13 36 29.4	7.325
2	13 44 36.42	2.2137	6 33 39.9	10.433	2	15 29 58.29	2.1852	13 43 46.5	7.246
3	13 46 49.21	2.2125	6 44 4.4	10.383	3	15 32 9.40	2.1850	13 50 58.9	7.166
4	13 49 1.92	2.2113	6 54 25.8	10.332	4	15 34 20.49	2.1848	13 58 6.4	7.084
5	13 51 14.57	2.2102	7 4 44.2	10.281	5	15 36 31.58	2.1847	14 5 9.0	7.003
6	13 53 27.15	2.2091	7 14 59.5	10.228	6	15 38 42.66	2.1846	14 12 6.8	6.922
7	13 55 39.66	2.2080	7 25 11.6	10.175	7	15 40 53.73	2.1844	14 18 59.7	6.840
8	13 57 52.11	2.2069	7 35 20.5	10.121	8	15 43 4.79	2.1843	14 25 47.6	6.757
9	14 0 4.49	2.2058	7 45 26.1	10.066	9	15 45 15.85	2.1842	14 32 30.5	6.674
10	14 2 16.81	2.2049	7 55 28.4	10.010	10	15 47 26.90	2.1841	14 39 8.5	6.592
11	14 4 29.08	2.2040	8 5 27.3	9.953	11	15 49 37.94	2.1839	14 45 41.5	6.508
12	14 6 41.29	2.2031	8 15 22.8	9.896	12	15 51 48.97	2.1838	14 52 9.5	6.424
13	14 8 53.45	2.2022	8 25 14.9	9.838	13	15 54 0.00	2.1837	14 58 32.4	6.340
14	14 11 5.55	2.2013	8 35 3.4	9.779	14	15 56 11.02	2.1836	15 4 50.3	6.256
15	14 13 17.60	2.2004	8 44 48.4	9.720	15	15 58 22.03	2.1835	15 11 3.1	6.171
16	14 15 29.60	2.1996	8 54 29.8	9.660	16	16 0 33.04	2.1834	15 17 10.8	6.085
17	14 17 41.55	2.1988	9 4 7.6	9.600	17	16 2 44.04	2.1833	15 23 13.3	5.999
18	14 19 53.45	2.1980	9 13 41.8	9.538	18	16 4 55.03	2.1832	15 29 10.7	5.913
19	14 22 5.31	2.1973	9 23 12.2	9.475	19	16 7 6.02	2.1831	15 35 2.9	5.827
20	14 24 17.13	2.1966	9 32 38.8	9.412	20	16 9 17.00	2.1829	15 40 49.9	5.741
21	14 26 28.90	2.1958	9 42 1.6	9.348	21	16 11 27.97	2.1828	15 46 31.8	5.654
22	14 28 40.63	2.1952	9 51 20.6	9.285	22	16 13 38.93	2.1827	15 52 8.4	5.566
23	14 30 52.33	2.1947	S. 10 0 35.8	9.221	23	16 15 49.89	2.1826	S. 15 57 39.7	5.478
	FRIDAY 6.					**SUNDAY 8.**			
0	14 33 3.99	2.1941	S. 10 9 47.1	9.155	0	16 18 0.84	2.1824	S. 16 3 5.8	5.391
1	14 35 15.62	2.1935	10 18 54.4	9.088	1	16 20 11.78	2.1822	16 8 26.6	5.303
2	14 37 27.21	2.1928	10 27 57.6	9.020	2	16 22 22.71	2.1821	16 13 42.1	5.214
3	14 39 38.76	2.1922	10 36 56.8	8.952	3	16 24 33.63	2.1820	16 18 52.3	5.126
4	14 41 50.28	2.1918	10 45 51.9	8.885	4	16 26 44.55	2.1819	16 23 57.2	5.037
5	14 44 1.78	2.1914	10 54 43.0	8.817	5	16 28 55.46	2.1818	16 28 56.7	4.947
6	14 46 13.25	2.1909	11 3 30.0	8.748	6	16 31 6.36	2.1816	16 33 50.9	4.858
7	14 48 24.69	2.1905	11 12 12.8	8.678	7	16 33 17.25	2.1814	16 38 39.7	4.768
8	14 50 36.11	2.1901	11 20 51.3	8.607	8	16 35 28.13	2.1812	16 43 23.1	4.678
9	14 52 47.50	2.1897	11 29 25.6	8.536	9	16 37 38.99	2.1809	16 48 1.1	4.588
10	14 54 58.87	2.1893	11 37 55.6	8.464	10	16 39 49.84	2.1807	16 52 33.7	4.498
11	14 57 10.21	2.1888	11 46 21.3	8.392	11	16 42 0.68	2.1805	16 57 0.9	4.408
12	14 59 21.53	2.1885	11 54 42.6	8.319	12	16 44 11.50	2.1802	17 1 22.7	4.317
13	15 1 32.83	2.1882	12 2 59.6	8.246	13	16 46 22.31	2.1800	17 5 39.0	4.226
14	15 3 44.11	2.1879	12 11 12.1	8.172	14	16 48 33.10	2.1797	17 9 49.8	4.135
15	15 5 55.38	2.1876	12 19 20.2	8.097	15	16 50 43.88	2.1795	17 13 55.2	4.044
16	15 8 6.63	2.1873	12 27 23.8	8.022	16	16 52 54.64	2.1792	17 17 55.1	3.952
17	15 10 17.86	2.1870	12 35 22.9	7.947	17	16 55 5.38	2.1789	17 21 49.5	3.861
18	15 12 29.07	2.1867	12 43 17.4	7.871	18	16 57 16.11	2.1787	17 25 38.4	3.769
19	15 14 40.27	2.1865	12 51 7.4	7.794	19	16 59 26.82	2.1783	17 29 21.8	3.677
20	15 16 51.45	2.1863	12 58 52.7	7.717	20	17 1 37.50	2.1779	17 32 59.7	3.585
21	15 19 2.62	2.1861	13 6 33.4	7.640	21	17 3 48.16	2.1775	17 36 32.0	3.493
22	15 21 13.78	2.1859	13 14 9.5	7.562	22	17 5 58.80	2.1772	17 39 58.8	3.401
23	15 23 24.93	2.1857	13 21 40.9	7.483	23	17 8 9.42	2.1768	17 43 20.1	3.308
24	15 25 36.06	2.1854	S. 13 29 7.5	7.404	24	17 10 20.01	2.1763	S. 17 46 35.8	3.216

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 9.					**WEDNESDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	17 10 20.01	2.1763	S. 17 46 35.8	3.216	0	18 53 54.47	2.1303	S. 18 34 2.3	1.209
1	17 12 30.58	2.1759	17 49 46.0	3.123	1	18 56 2.24	2.1288	18 32 47.1	1.298
2	17 14 41.12	2.1754	17 52 50.6	3.030	2	18 58 9.92	2.1272	18 31 26.6	1.387
3	17 16 51.63	2.1749	17 55 49.6	2.937	3	19 0 17.50	2.1255	18 30 0.7	1.476
4	17 19 2.11	2.1744	17 58 43.1	2.845	4	19 2 24.98	2.1239	18 28 29.5	1.563
5	17 21 12.56	2.1739	18 1 31.0	2.752	5	19 4 32.37	2.1223	18 26 53.1	1.651
6	17 23 22.98	2.1734	18 4 13.3	2.658	6	19 6 39.66	2.1207	18 25 11.4	1.738
7	17 25 33.37	2.1728	18 6 50.0	2.565	7	19 8 46.85	2.1190	18 23 24.5	1.826
8	17 27 43.72	2.1723	18 9 21.1	2.472	8	19 10 53.94	2.1173	18 21 32.3	1.913
9	17 29 54.04	2.1717	18 11 46.7	2.379	9	19 13 0.93	2.1156	18 19 34.9	1.999
10	17 32 4.32	2.1710	18 14 6.6	2.285	10	19 15 7.81	2.1138	18 17 32.4	2.085
11	17 34 14.56	2.1704	18 16 20.9	2.192	11	19 17 14.59	2.1121	18 15 24.7	2.172
12	17 36 24.77	2.1698	18 18 29.7	2.100	12	19 19 21.26	2.1103	18 13 11.8	2.256
13	17 38 34.94	2.1691	18 20 32.9	2.007	13	19 21 27.82	2.1085	18 10 53.8	2.343
14	17 40 45.06	2.1684	18 22 30.5	1.913	14	19 23 34.28	2.1067	18 8 30.7	2.427
15	17 42 55.14	2.1677	18 24 22.4	1.819	15	19 25 40.63	2.1049	18 6 2.6	2.511
16	17 45 5.18	2.1669	18 26 8.7	1.726	16	19 27 46.87	2.1030	18 3 29.4	2.596
17	17 47 15.17	2.1661	18 27 49.5	1.633	17	19 29 52.99	2.1011	18 0 51.1	2.681
18	17 49 25.11	2.1652	18 29 24.7	1.539	18	19 31 59.00	2.0992	17 58 7.7	2.765
19	17 51 35.00	2.1645	18 30 54.2	1.446	19	19 34 4.90	2.0973	17 55 19.3	2.848
20	17 53 44.85	2.1637	18 32 18.2	1.353	20	19 36 10.68	2.0954	17 52 26.0	2.930
21	17 55 54.65	2.1628	18 33 36.6	1.260	21	19 38 16.35	2.0935	17 49 27.7	3.012
22	17 58 4.39	2.1619	18 34 49.4	1.167	22	19 40 21.90	2.0915	17 46 24.5	3.094
23	18 0 14.08	2.1611	S. 18 35 56.6	1.074	23	19 42 27.33	2.0895	S. 17 43 16.4	3.176
	TUESDAY 10.					**THURSDAY 12.**			
0	18 2 23.72	2.1602	S. 18 36 58.3	0.982	0	19 44 32.64	2.0875	S. 17 40 3.3	3.258
1	18 4 33.30	2.1592	18 37 54.4	0.888	1	19 46 37.83	2.0855	17 36 45.4	3.339
2	18 6 42.82	2.1582	18 38 44.9	0.795	2	19 48 42.90	2.0835	17 33 22.6	3.420
3	18 8 52.28	2.1572	18 39 29.8	0.702	3	19 50 47.85	2.0815	17 29 55.0	3 500
4	18 11 1.68	2.1561	18 40 9.2	0.610	4	19 52 52.68	2.0795	17 26 22.6	3.579
5	18 13 11.01	2.1550	18 40 43.0	0.518	5	19 54 57.39	2.0774	17 22 45.5	3.658
6	18 15 20.28	2.1539	18 41 11.3	0.426	6	19 57 1.97	2.0753	17 19 3.6	3.737
7	18 17 29.48	2.1528	18 41 34.1	0.333	7	19 59 6.43	2.0732	17 15 17.0	3.816
8	18 19 38.62	2.1517	18 41 51.3	0.241	8	20 1 10.76	2.0711	17 11 25.7	3.894
9	18 21 47.69	2.1506	18 42 3.0	0.149	9	20 3 14.96	2.0690	17 7 29.7	3.972
10	18 23 56.69	2.1494	18 42 9.2	− 0.057	10	20 5 19.04	2.0669	17 3 29.1	4.049
11	18 26 5.62	2.1482	18 42 9.9	+ 0.035	11	20 7 22.99	2.0648	16 59 23.8	4.126
12	18 28 14.47	2.1469	18 42 5.0	0.127	12	20 9 26.82	2.0627	16 55 13.9	4.203
13	18 30 23.25	2.1457	18 41 54.7	0.218	13	20 11 30.52	2.0606	16 50 59.4	4.279
14	18 32 31.95	2.1444	18 41 38.9	0.309	14	20 13 34.09	2.0584	16 46 40.4	4.354
15	18 34 40.58	2.1431	18 41 17.6	0.400	15	20 15 37.53	2.0562	16 42 16.9	4.429
16	18 36 49.13	2.1417	18 40 50.9	0.491	16	20 17 40.83	2.0539	16 37 48.9	4.503
17	18 38 57.59	2.1403	18 40 18.7	0.582	17	20 19 44.00	2.0517	16 33 16.5	4.578
18	18 41 5.97	2.1390	18 39 41.1	0.672	18	20 21 47.04	2.0496	16 28 39.6	4.652
19	18 43 14.27	2.1376	18 38 58.1	0.762	19	20 23 49.95	2.0474	16 23 58.3	4.725
20	18 45 22.48	2.1362	18 38 9.7	0.852	20	20 25 52.73	2.0452	16 19 12.6	4.797
21	18 47 30.61	2.1347	18 37 15.9	0.942	21	20 27 55.38	2.0431	16 14 22.6	4.869
22	18 49 38.65	2.1332	18 36 16.7	1.031	22	20 29 57.90	2.0409	16 9 28.3	4.941
23	18 51 46.60	2.1318	18 35 12.2	1.120	23	20 32 0.29	2.0387	16 4 29.7	5.013
24	18 53 54.47	2.1303	S. 18 34 2.3	1.209	24	20 34 2.54	2.0364	S. 15 59 26.7	5.085

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 34 2.54	2.0364	S. 15 59 26.7	5.085
1	20 36 4.66	2.0342	15 54 19.5	5.154
2	20 38 6.65	2.0321	15 49 8.2	5.223
3	20 40 8.51	2.0298	15 43 52.7	5.292
4	20 42 10.23	2.0276	15 38 33.1	5.361
5	20 44 11.82	2.0253	15 33 9.4	5.430
6	20 46 13.27	2.0231	15 27 41.5	5.498
7	20 48 14.59	2.0209	15 22 9.6	5.565
8	20 50 15.78	2.0187	15 16 33.7	5.632
9	20 52 16.83	2.0164	15 10 53.8	5.698
10	20 54 17.75	2.0142	15 5 10.0	5.764
11	20 56 18.54	2.0120	14 59 22.2	5.829
12	20 58 19.19	2.0098	14 53 30.5	5.893
13	21 0 19.71	2.0076	14 47 35.0	5.958
14	21 2 20.10	2.0053	14 41 35.6	6.022
15	21 4 20.35	2.0031	14 35 32.4	6.084
16	21 6 20.47	2.0009	14 29 25.5	6.147
17	21 8 20.46	1.9987	14 23 14.8	6.209
18	21 10 20.32	1.9966	14 17 0.4	6.271
19	21 12 20.05	1.9944	14 10 42.3	6.332
20	21 14 19.65	1.9922	14 4 20.6	6.392
21	21 16 19.12	1.9901	13 57 55.3	6.452
22	21 18 18.46	1.9879	13 51 26.4	6.511
23	21 20 17.67	1.9858	S. 13 44 54.0	6.570

SATURDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	21 22 16.76	1.9837	S. 13 38 18.0	6.628
1	21 24 15.72	1.9816	13 31 38.6	6.686
2	21 26 14.55	1.9794	13 24 55.7	6.743
3	21 28 13.25	1.9773	13 18 9.4	6.800
4	21 30 11.83	1.9753	13 11 19.7	6.856
5	21 32 10.29	1.9732	13 4 26.7	6.911
6	21 34 8.62	1.9712	12 57 30.4	6.966
7	21 36 6.83	1.9691	12 50 30.8	7.020
8	21 38 4.91	1.9670	12 43 28.0	7.074
9	21 40 2.87	1.9650	12 36 21.9	7.128
10	21 42 0.71	1.9630	12 29 12.6	7.181
11	21 43 58.43	1.9610	12 22 0.2	7.233
12	21 45 56.03	1.9590	12 14 44.7	7.284
13	21 47 53.51	1.9570	12 7 26.1	7.335
14	21 49 50.87	1.9551	12 0 4.5	7.385
15	21 51 48.12	1.9532	11 52 39.9	7.435
16	21 53 45.25	1.9513	11 45 12.3	7.485
17	21 55 42.27	1.9494	11 37 41.7	7.534
18	21 57 39.18	1.9476	11 30 8.2	7.582
19	21 59 35.98	1.9457	11 22 31.8	7.630
20	22 1 32.66	1.9438	11 14 52.6	7.677
21	22 3 29.23	1.9420	11 7 10.6	7.723
22	22 5 25.70	1.9402	10 59 25.8	7.769
23	22 7 22.06	1.9384	10 51 38.3	7.814
24	22 9 18.31	1.9367	S. 10 43 48.1	7.859

SUNDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 9 18.31	1.9367	S. 10 43 48.1	7.859
1	22 11 14.46	1.9349	10 35 55.2	7.903
2	22 13 10.50	1.9332	10 27 59.7	7.947
3	22 15 6.44	1.9315	10 20 1.5	7.991
4	22 17 2.28	1.9298	10 12 0.8	8.033
5	22 18 58.02	1.9282	10 3 57.6	8.074
6	22 20 53.67	1.9266	9 55 51.9	8.116
7	22 22 49.22	1.9250	9 47 43.7	8.157
8	22 24 44.67	1.9234	9 39 33.1	8.197
9	22 26 40.03	1.9219	9 31 20.1	8.237
10	22 28 35.30	1.9204	9 23 4.7	8.276
11	22 30 30.48	1.9189	9 14 47.0	8.314
12	22 32 25.57	1.9174	9 6 27.0	8.352
13	22 34 20.57	1.9160	8 58 4.8	8.389
14	22 36 15.49	1.9146	8 49 40.3	8.426
15	22 38 10.32	1.9132	8 41 13.6	8.462
16	22 40 5.07	1.9118	8 32 44.8	8.498
17	22 41 59.74	1.9106	8 24 13.8	8.534
18	22 43 54.34	1.9093	8 15 40.7	8.568
19	22 45 48.86	1.9080	8 7 5.6	8.602
20	22 47 43.30	1.9067	7 58 28.5	8.636
21	22 49 37.66	1.9054	7 49 49.3	8.669
22	22 51 31.95	1.9043	7 41 8.2	8.701
23	22 53 26.17	1.9032	S. 7 32 25.2	8.732

MONDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 55 20.33	1.9021	S. 7 23 40.4	8.762
1	22 57 14.42	1.9010	7 14 53.7	8.793
2	22 59 8.45	1.8999	7 6 5.2	8.823
3	23 1 2.41	1.8988	6 57 14.9	8.853
4	23 2 56.31	1.8978	6 48 22.8	8.882
5	23 4 50.15	1.8969	6 39 29.0	8.910
6	23 6 43.94	1.8960	6 30 33.6	8.937
7	23 8 37.67	1.8951	6 21 36.5	8.965
8	23 10 31.35	1.8942	6 12 37.8	8.992
9	23 12 24.98	1.8934	6 3 37.5	9.018
10	23 14 18.56	1.8926	5 54 35.7	9.043
11	23 16 12.09	1.8918	5 45 32.4	9.068
12	23 18 5.58	1.8912	5 36 27.6	9.093
13	23 19 59.03	1.8905	5 27 21.3	9.117
14	23 21 52.44	1.8898	5 18 13.6	9.139
15	23 23 45.81	1.8892	5 9 4.6	9.161
16	23 25 39.14	1.8885	4 59 54.3	9.182
17	23 27 32.43	1.8879	4 50 42.7	9.204
18	23 29 25.69	1.8875	4 41 29.8	9.226
19	23 31 18.93	1.8871	4 32 15.6	9.247
20	23 33 12.14	1.8866	4 23 0.2	9.266
21	23 35 5.32	1.8862	4 13 43.7	9.284
22	23 36 58.48	1.8858	4 4 26.1	9.302
23	23 38 51.62	1.8855	3 55 7.4	9.321
24	23 40 44.74	1.8852	S. 3 45 47.6	9.339

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 17.					**THURSDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 40 44.74	1.8852	S. 3 45 47.6	9.339	0	1 11 40.75	1.9203	N. 3 51 37.9	9.496
1	23 42 37.85	1.8850	3 36 26.7	9.356	1	1 13 36.02	1.9221	4 1 7.3	9.485
2	23 44 30.94	1.8848	3 27 4.9	9.372	2	1 15 31.40	1.9240	4 10 36.1	9.474
3	23 46 24.02	1.8846	3 17 42.1	9.387	3	1 17 26.90	1.9259	4 20 4.2	9.462
4	23 48 17.09	1.8844	3 8 18.4	9.402	4	1 19 22.51	1.9278	4 29 31.5	9.448
5	23 50 10.15	1.8843	2 58 53.8	9.417	5	1 21 18.23	1.9297	4 38 57.9	9.433
6	23 52 3.21	1.8842	2 49 28.3	9.432	6	1 23 14.07	1.9318	4 48 23.5	9.419
7	23 53 56.26	1.8842	2 40 2.0	9.445	7	1 25 10.04	1.9339	4 57 48.2	9.404
8	23 55 49.32	1.8843	2 30 34.9	9.458	8	1 27 6.14	1.9360	5 7 12.0	9.389
9	23 57 42.38	1.8844	2 21 7.1	9.470	9	1 29 2.36	1.9382	5 16 34.9	9.373
10	23 59 35.45	1.8845	2 11 38.5	9.482	10	1 30 58.72	1.9405	5 25 56.8	9.356
11	0 1 28.52	1.8846	2 2 9.3	9.493	11	1 32 55.22	1.9427	5 35 17.6	9.338
12	0 3 21.60	1.8848	1 52 39.4	9.503	12	1 34 51.85	1.9450	5 44 37.3	9.319
13	0 5 14.69	1.8850	1 43 8.9	9.513	13	1 36 48.62	1.9474	5 53 55.9	9.301
14	0 7 7.80	1.8853	1 33 37.8	9.523	14	1 38 45.54	1.9498	6 3 13.4	9.282
15	0 9 0.93	1.8857	1 24 6.2	9.532	15	1 40 42.60	1.9522	6 12 29.7	9.261
16	0 10 54.08	1.8860	1 14 34.0	9.540	16	1 42 39.81	1.9548	6 21 44.7	9.240
17	0 12 47.25	1.8863	1 5 1.4	9.547	17	1 44 37.18	1.9574	6 30 58.5	9.219
18	0 14 40.44	1.8867	0 55 28.3	9.555	18	1 46 34.70	1.9600	6 40 11.0	9.197
19	0 16 33.66	1.8872	0 45 54.8	9.562	19	1 48 32.38	1.9627	6 49 22.1	9.173
20	0 18 26.91	1.8878	0 36 20.9	9.567	20	1 50 30.22	1.9653	6 58 31.8	9.150
21	0 20 20.20	1.8884	0 26 46.7	9.572	21	1 52 28.22	1.9681	7 7 40.1	9.126
22	0 22 13.52	1.8890	0 17 12.2	9.577	22	1 54 26.39	1.9708	7 16 46.9	9.101
23	0 24 6.88	1.8896	S. 0 7 37.4	9.582	23	1 56 24.72	1.9736	N. 7 25 52.2	9.076
	WEDNESDAY 18.					**FRIDAY 20.**			
0	0 26 0.27	1.8903	N. 0 1 57.6	9.585	0	1 58 23.22	1.9765	N. 7 34 56.0	9.050
1	0 27 53.71	1.8911	0 11 32.8	9.588	1	2 0 21.90	1.9794	7 43 58.2	9.023
2	0 29 47.20	1.8918	0 21 8.2	9.591	2	2 2 20.75	1.9823	7 52 58.7	8.995
3	0 31 40.73	1.8927	0 30 43.8	9.593	3	2 4 19.78	1.9853	8 1 57.6	8.967
4	0 33 34.32	1.8936	0 40 19.4	9.594	4	2 6 18.99	1.9884	8 10 54.7	8.938
5	0 35 27.96	1.8944	0 49 55.1	9.595	5	2 8 18.39	1.9916	8 19 50.1	8.908
6	0 37 21.65	1.8953	0 59 30.8	9.595	6	2 10 17.98	1.9947	8 28 43.7	8.878
7	0 39 15.40	1.8963	1 9 6.5	9.595	7	2 12 17.76	1.9979	8 37 35.5	8.846
8	0 41 9.21	1.8974	1 18 42.2	9.594	8	2 14 17.73	2.0011	8 46 25.3	8.814
9	0 43 3.09	1.8986	1 28 17.8	9.592	9	2 16 17.89	2.0043	8 55 13.2	8.782
10.	0 44 57.04	1.8997	1 37 53.3	9.590	10	2 18 18.25	2.0077	9 3 59.1	8.748
11	0 46 51.05	1.9008	1 47 28.6	9.587	11	2 20 18.81	2.0111	9 12 43.0	8.715
12	0 48 45.13	1.9020	1 57 3.7	9.583	12	2 22 19.58	2.0146	9 21 24.9	8.681
13	0 50 39.29	1.9033	2 6 38.6	9.580	13	2 24 20.56	2.0180	9 30 4.7	8.645
14	0 52 33.53	1.9047	2 16 13.3	9.576	14	2 26 21.74	2.0214	9 38 42.3	8.608
15	0 54 27.85	1.9060	2 25 47.7	9.570	15	2 28 23.13	2.0249	9 47 17.7	8.571
16	0 56 22.25	1.9073	2 35 21.7	9.564	16	2 30 24.73	2.0285	9 55 50.8	8.534
17	0 58 16.73	1.9088	2 44 55.4	9.558	17	2 32 26.55	2.0322	10 4 21.7	8.496
18	1 0 11.30	1.9103	2 54 28.7	9.551	18	2 34 28.59	2.0358	10 12 50.3	8.457
19	1 2 5.97	1.9119	3 4 1.5	9.543	19	2 36 30.85	2.0395	10 21 16.5	8.417
20	1 4 0.73	1.9134	3 13 33.9	9.536	20	2 38 33.33	2.0432	10 29 40.3	8.376
21	1 5 55.58	1.9150	3 23 5.8	9.527	21	2 40 36.04	2.0470	10 38 1.6	8.334
22	1 7 50.53	1.9167	3 32 37.1	9.517	22	2 42 38.97	2.0508	10 46 20.4	8.292
23	1 9 45.59	1.9185	3 42 7.8	9.507	23	2 44 42.14	2.0547	10 54 36.6	8.248
24	1 11 40.75	1.9203	N. 3 51 37.9	9.496	24	2 46 45.54	2.0587	N. 11 2 50.2	8.204

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 21.					**MONDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 46 45.54	2.0587	N.11 2 50.2	8.204	0	4 30 40.81	2.2802	N.16 30 23.9	5.107
1	2 48 49.18	2.0626	11 11 1.1	8.160	1	4 32 57.77	2.2852	16 35 27.8	5.021
2	2 50 53.05	2.0665	11 19 9.4	8.116	2	4 35 15.04	2.2903	16 40 26.4	4.934
3	2 52 57.16	2.0706	11 27 15.0	8.070	3	4 37 32.61	2.2953	16 45 19.8	4.846
4	2 55 1.52	2.0747	11 35 17.8	8.022	4	4 39 50.48	2.3002	16 50 7.9	4.757
5	2 57 6.12	2.0787	11 43 17.7	7.974	5	4 42 8.64	2.3052	16 54 50.6	4.666
6	2 59 10.96	2.0828	11 51 14.7	7.926	6	4 44 27.10	2.3102	16 59 27.8	4.574
7	3 1 16.05	2.0870	11 59 8.8	7.877	7	4 46 45.86	2.3151	17 3 59.5	4.482
8	3 3 21.40	2.0912	12 6 59.9	7.826	8	4 49 4.91	2.3200	17 8 25.7	4.390
9	3 5 27.00	2.0954	12 14 47.9	7.774	9	4 51 24.26	2.3250	17 12 46.3	4.297
10	3 7 32.85	2.0997	12 22 32.8	7.722	10	4 53 43.91	2.3299	17 17 1.3	4.202
11	3 9 38.96	2.1040	12 30 14.6	7.670	11	4 56 3.85	2.3348	17 21 10.5	4.105
12	3 11 45.33	2.1083	12 37 53.2	7.616	12	4 58 24.09	2.3397	17 25 13.9	4.008
13	3 13 51.96	2.1127	12 45 28.5	7.562	13	5 0 44.62	2.3446	17 29 11.5	3.911
14	3 15 58.85	2.1171	12 53 0.6	7.507	14	5 3 5.44	2.3494	17 33 3.3	3.814
15	3 18 6.01	2.1216	13 0 29.4	7.452	15	5 5 26.55	2.3542	17 36 49.2	3.715
16	3 20 13.44	2.1261	13 7 54.8	7.394	16	5 7 47.95	2.3591	17 40 29.1	3.614
17	3 22 21.14	2.1305	13 15 16.7	7.336	17	5 10 9.64	2.3639	17 44 2.9	3.513
18	3 24 29.10	2.1350	13 22 35.1	7.277	18	5 12 31.62	2.3687	17 47 30.7	3.412
19	3 26 37.34	2.1396	13 29 50.0	7.218	19	5 14 53.88	2.3734	17 50 52.4	3.310
20	3 28 45.85	2.1442	13 37 1.3	7.158	20	5 17 16.42	2.3781	17 54 7.9	3.206
21	3 30 54.64	2.1488	13 44 9.0	7.097	21	5 19 39.25	2.3827	17 57 17.1	3.101
22	3 33 3.71	2.1535	13 51 13.0	7.035	22	5 22 2.35	2.3873	18 0 20.0	2.996
23	3 35 13.06	2.1581	N.13 58 13.2	6.972	23	5 24 25.73	2.3920	N.18 3 16.6	2.891
	SUNDAY 22.					**TUESDAY 24.**			
0	3 37 22.68	2.1627	N.14 5 9.7	6.909	0	5 26 49.39	2.3966	N.18 6 6.9	2.784
1	3 39 32.58	2.1674	14 12 2.3	6.844	1	5 29 13.32	2.4011	18 8 50.7	2.676
2	3 41 42.77	2.1722	14 18 51.0	6.778	2	5 31 37.52	2.4057	18 11 28.0	2.568
3	3 43 53.25	2.1770	14 25 35.7	6.712	3	5 34 2.00	2.4102	18 13 58.8	2.459
4	3 46 4.01	2.1817	14 32 16.4	6.644	4	5 36 26.74	2.4146	18 16 23.1	2.349
5	3 48 15.06	2.1865	14 38 53.0	6.576	5	5 38 51.75	2.4190	18 18 40.7	2.238
6	3 50 26.39	2.1913	14 45 25.5	6.507	6	5 41 17.02	2.4233	18 20 51.6	2.126
7	3 52 38.01	2.1962	14 51 53.8	6.437	7	5 43 42.55	2.4276	18 22 55.8	2.014
8	3 54 49.93	2.2011	14 58 17.9	6.366	8	5 46 8.33	2.4318	18 24 53.3	1.902
9	3 57 2.14	2.2059	15 4 37.7	6.294	9	5 48 34.37	2.4361	18 26 44.0	1.788
10	3 59 14.64	2.2108	15 10 53.2	6.222	10	5 51 0.66	2.4403	18 28 27.9	1.673
11	4 1 27.44	2.2157	15 17 4.3	6.148	11	5 53 27.20	2.4444	18 30 4.8	1.557
12	4 3 40.53	2.2207	15 23 10.9	6.073	12	5 55 53.99	2.4485	18 31 34.8	1.442
13	4 5 53.92	2.2256	15 29 13.0	5.998	13	5 58 21.02	2.4525	18 32 57.9	1.326
14	4 8 7.60	2.2305	15 35 10.6	5.922	14	6 0 48.29	2.4564	18 34 13.9	1.209
15	4 10 21.58	2.2355	15 41 3.6	5.844	15	6 3 15.79	2.4603	18 35 22.9	1.091
16	4 12 35.86	2.2404	15 46 51.9	5.766	16	6 5 43.53	2.4642	18 36 24.8	0.972
17	4 14 50.43	2.2453	15 52 35.5	5.687	17	6 8 11.49	2.4679	18 37 19.5	0.853
18	4 17 5.30	2.2503	15 58 14.3	5.607	18	6 10 39.68	2.4716	18 38 7.1	0.733
19	4 19 20.47	2.2553	16 3 48.3	5.526	19	6 13 8.09	2.4753	18 38 47.5	0.612
20	4 21 35.94	2.2603	16 9 17.4	5.444	20	6 15 36.72	2.4790	18 39 20.6	0.492
21	4 23 51.71	2.2653	16 14 41.6	5.362	21	6 18 5.57	2.4826	18 39 46.5	0.371
22	4 26 7.78	2.2703	16 20 0.8	5.277	22	6 20 34.63	2.4861	18 40 5.1	0.248
23	4 28 24.15	2.2752	16 25 14.9	5.192	23	6 23 3.90	2.4895	18 40 16.3	0.125
24	4 30 40.81	2.2802	N.16 30 23.9	5.107	24	6 25 33.37	2.4928	N.18 40 20.1	+ 0.002

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 25 33.37	2.4928	N.18 40 20.1	+ 0.002
1	6 28 3.04	2.4961	18 40 16.5	– 0.122
2	6 30 32.90	2.4993	18 40 5.5	0.245
3	6 33 2.95	2.5024	18 39 47.1	0.369
4	6 35 33.19	2.5056	18 39 21.2	0.494
5	6 38 3.62	2.5087	18 38 47.8	0.620
6	6 40 34.23	2.5116	18 38 6.8	0.746
7	6 43 5.01	2.5143	18 37 18.3	0.872
8	6 45 35.95	2.5171	18 36 22.2	0.998
9	6 48 7.06	2.5198	18 35 18.5	1.125
10	6 50 38.33	2.5225	18 34 7.2	1.252
11	6 53 9.76	2.5251	18 32 48.2	1.380
12	6 55 41.34	2.5276	18 31 21.6	1.508
13	6 58 13.07	2.5300	18 29 47.3	1.636
14	7 0 44.94	2.5322	18 28 5.3	1.763
15	7 3 16.94	2.5344	18 26 15.7	1.892
16	7 5 49.07	2.5366	18 24 18.3	2.021
17	7 8 21.34	2.5388	18 22 13.2	2.149
18	7 10 53.73	2.5408	18 20 0.4	2.278
19	7 13 26.24	2.5427	18 17 39.9	2.407
20	7 15 58.86	2.5446	18 15 11.6	2.536
21	7 18 31.59	2.5463	18 12 35.6	2.665
22	7 21 4.42	2.5480	18 9 51.8	2.794
23	7 23 37.35	2.5497	N.18 7 0.3	2.923

THURSDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 26 10.38	2.5512	N.18 4 1.0	3.052
1	7 28 43.50	2.5526	18 0 54.0	3.182
2	7 31 16.70	2.5539	17 57 39.2	3.311
3	7 33 49.97	2.5552	17 54 16.7	3.439
4	7 36 23.32	2.5563	17 50 46.5	3.568
5	7 38 56.73	2.5574	17 47 8.6	3.697
6	7 41 30.21	2.5585	17 43 22.9	3.826
7	7 44 3.75	2.5594	17 39 29.5	3.954
8	7 46 37.34	2.5602	17 35 28.4	4.082
9	7 49 10.98	2.5610	17 31 19.7	4.209
10	7 51 44.66	2.5617	17 27 3.3	4.337
11	7 54 18.38	2.5623	17 22 39.3	4.464
12	7 56 52.14	2.5629	17 18 7.6	4.591
13	7 59 25.93	2.5633	17 13 28.3	4.717
14	8 1 59.74	2.5636	17 8 41.5	4.843
15	8 4 33.56	2.5638	17 3 47.1	4.970
16	8 7 7.40	2.5641	16 58 45.1	5.095
17	8 9 41.25	2.5642	16 53 35.7	5.219
18	8 12 15.11	2.5642	16 48 18.8	5.344
19	8 14 48.96	2.5642	16 42 54.4	5.468
20	8 17 22.81	2.5641	16 37 22.6	5.591
21	8 19 56.65	2.5638	16 31 43.5	5.714
22	8 22 30.47	2.5636	16 25 57.0	5.836
23	8 25 4.28	2.5633	16 20 3.2	5.957
24	8 27 38.07	2.5629	N.16 14 2.1	6.078

FRIDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 27 38.07	2.5629	N.16 14 2.1	6.078
1	8 30 11.83	2.5623	16 7 53.8	6.198
2	8 32 45.55	2.5617	16 1 38.3	6.318
3	8 35 19.24	2.5611	15 55 15.6	6.437
4	8 37 52.88	2.5604	15 48 45.8	6.555
5	8 40 26.48	2.5596	15 42 9.0	6.673
6	8 43 0.03	2.5587	15 35 25.2	6.789
7	8 45 33.52	2.5577	15 28 34.4	6.904
8	8 48 6.95	2.5567	15 21 36.7	7.018
9	8 50 40.33	2.5557	15 14 32.2	7.132
10	8 53 13.64	2.5546	15 7 20.9	7.245
11	8 55 46.88	2.5534	15 0 2.8	7.357
12	8 58 20.05	2.5522	14 52 38.0	7.469
13	9 0 53.14	2.5508	14 45 6.5	7.579
14	9 3 26.14	2.5493	14 37 28.5	7.687
15	9 5 59.06	2.5479	14 29 44.0	7.795
16	9 8 31.89	2.5464	14 21 53.1	7.903
17	9 11 4.63	2.5449	14 13 55.7	8.009
18	9 13 37.28	2.5433	14 5 52.0	8.113
19	9 16 9.83	2.5416	13 57 42.1	8.217
20	9 18 42.27	2.5398	13 49 25.9	8.321
21	9 21 14.61	2.5381	13 41 3.6	8.422
22	9 23 46.84	2.5362	13 32 35.3	8.522
23	9 26 18.96	2.5343	N.13 24 1.0	8.622

SATURDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 28 50.96	2.5323	N.13 15 20.7	8.720
1	9 31 22.84	2.5304	13 6 34.6	8.817
2	9 33 54.61	2.5285	12 57 42.7	8.912
3	9 36 26.26	2.5265	12 48 45.2	9.005
4	9 38 57.79	2.5243	12 39 42.1	9.096
5	9 41 29.18	2.5221	12 30 33.4	9.191
6	9 44 0.44	2.5199	12 21 19.2	9.281
7	9 46 31.57	2.5177	12 11 59.7	9.370
8	9 49 2.56	2.5154	12 2 34.8	9.458
9	9 51 33.42	2.5131	11 53 4.7	9.544
10	9 54 4.14	2.5108	11 43 29.5	9.629
11	9 56 34.72	2.5085	11 33 49.2	9.712
12	9 59 5.16	2.5061	11 24 4.0	9.794
13	10 1 35.45	2.5037	11 14 13.9	9.875
14	10 4 5.60	2.5012	11 4 19.0	9.955
15	10 6 35.60	2.4987	10 54 19.3	10.033
16	10 9 5.45	2.4962	10 44 15.0	10.109
17	10 11 35.15	2.4937	10 34 6.2	10.184
18	10 14 4.69	2.4911	10 23 52.9	10.257
19	10 16 34.08	2.4885	10 13 35.3	10.329
20	10 19 3.31	2.4859	10 3 13.4	10.400
21	10 21 32.39	2.4833	9 52 47.3	10.469
22	10 24 1.31	2.4807	9 42 17.1	10.537
23	10 26 30.07	2.4781	9 31 42.9	10.603
24	10 28 58.68	2.4755	N. 9 21 4.8	10.667

GREENWICH MEAN TIME.

. THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 28 58.68	2.4755	N. 9 21 4.8	10.667
1	10 31 27.13	2.4728	9 10 22.9	10.730
2	10 33 55.41	2.4700	8 59 37.2	10.792
3	10 36 23.53	2.4673	8 48 47.9	10.851
4	10 38 51.49	2.4646	8 37 55.1	10.909
5	10 41 19.28	2.4618	8 26 58.8	10.966
6	10 43 46.91	2.4591	8 15 59.2	11.021
7	10 46 14.38	2.4564	8 4 56.3	11.075
8	10 48 41.68	2.4537	7 53 50.2	11.127
9	10 51 8.82	2.4509	7 42 41.1	11.177
10	10 53 35.79	2.4482	7 31 29.0	11.226
11	10 56 2.60	2.4454	7 20 14.0	11.273
12	10 58 29.24	2.4427	7 8 56.2	11.319
13	11 0 55.72	2.4399	6 57 35.7	11.362
14	11 3 22.03	2.4371	6 46 12.7	11.404
15	11 5 48.17	2.4343	6 34 47.2	11.445
16	11 8 14.15	2.4316	6 23 19.3	11.485
17	11 10 39.97	2.4289	6 11 49.0	11.523
18	11 13 5.62	2.4262	6 0 16.5	11.559
19	11 15 31.11	2.4234	5 48 41.9	11.593
20	11 17 56.43	2.4207	5 37 5.3	11.626
21	11 20 21.59	2.4180	5 25 26.8	11.657
22	11 22 46.59	2.4152	5 13 46.5	11.687
23	11 25 11.42	2.4125	N. 5 2 4.4	11.715

MONDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 27 36.09	2.4098	N. 4 50 20.7	11.741
1	11 30 0.60	2.4072	4 38 35.5	11.766
2	11 32 24.95	2.4045	4 26 48.8	11.790
3	11 34 49.14	2.4018	4 15 0.7	11.812
4	11 37 13.17	2.3992	4 3 11.4	11.831
5	11 39 37.04	2.3966	3 51 21.0	11.849
6	11 42 0.76	2.3940	3 39 29.5	11.867
7	11 44 24.32	2.3913	3 27 37.0	11.882
8	11 46 47.72	2.3887	3 15 43.7	11.895
9	11 49 10.97	2.3862	3 3 49.6	11.907
10	11 51 34.07	2.3837	2 51 54.8	11.919
11	11 53 57.01	2.3811	2 39 59.3	11.928
12	11 56 19.80	2.3786	2 28 3.4	11.935
13	11 58 42.44	2.3761	2 16 7.1	11.942
14	12 1 4.93	2.3736	2 4 10.4	11.947
15	12 3 27.27	2.3712	1 52 13.5	11.949
16	12 5 49.47	2.3687	1 40 16.5	11.951
17	12 8 11.52	2.3663	1 28 19.4	11.952
18	12 10 33.43	2.3640	1 16 22.3	11.951
19	12 12 55.20	2.3616	1 4 25.3	11.947
20	12 15 16.82	2.3592	0 52 28.6	11.942
21	12 17 38.30	2.3569	0 40 32.2	11.937
22	12 19 59.64	2.3546	0 28 36.2	11.930
23	12 22 20.85	2.3523	0 16 40.6	11.922
24	12 24 41.92	2.3501	N. 0 4 45.6	11.912

TUESDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 24 41.92	2.3501	N. 0 4 45.6	11.912
1	12 27 2.86	2.3478	S. 0 7 8.8	11.900
2	12 29 23.66	2.3456	0 19 2.4	11.887
3	12 31 44.33	2.3434	0 30 55.2	11.872
4	12 34 4.87	2.3412	0 42 47.1	11.857
5	12 36 25.28	2.3391	0 54 38.0	11.840
6	12 38 45.56	2.3370	1 6 27.9	11.822
7	12 41 5.72	2.3349	1 18 16.7	11.802
8	12 43 25.75	2.3328	1 30 4.2	11.781
9	12 45 45.66	2.3308	1 41 50.4	11.758
10	12 48 5.45	2.3288	1 53 35.2	11.735
11	12 50 25.12	2.3268	2 5 18.6	11.710
12	12 52 44.67	2.3248	2 17 0.4	11.683
13	12 55 4.10	2.3229	2 28 40.6	11.656
14	12 57 23.42	2.3210	2 40 19.1	11.627
15	12 59 42.62	2.3191	2 51 55.8	11.597
16	13 2 1.71	2.3173	3 3 30.7	11.565
17	13 4 20.69	2.3155	3 15 3.6	11.532
18	13 6 39.57	2.3137	3 26 34.5	11.498
19	13 8 58.34	2.3119	3 38 3.4	11.463
20	13 11 17.00	2.3101	3 49 30.1	11.427
21	13 13 35.55	2.3083	4 0 54.6	11.389
22	13 15 54.00	2.3067	4 12 16.8	11.351
23	13 18 12.35	2.3050	S. 4 23 36.7	11.311

WEDNESDAY, SEPTEMBER 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 20 30.60	2.3033	S. 4 34 54.1	11.269

PHASES OF THE MOON.

		d	h	m
☽ First Quarter	August	6	9	6.2
○ Full Moon		14	6	24.2
☾ Last Quarter. . . .		22	7	41.8
● New Moon		29	0	54.3

		d	h
☾ Apogee. . .	August	15	1.7
☾ Perigee.		29	1.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Sun	W.	18° 4′ 10″	2394	19° 49′ 35″	2391	21° 35′ 4″	2391	23° 20′ 33″	2393
	Mars	E.	50 4 2	2188	48 15 16	2194	46 26 39	2200	44 38 11	2207
	Spica	E.	55 5 54	2032	53 13 9	2037	51 20 33	2044	49 28 8	2052
	Antares	E.	100 55 13	2064	99 3 18	2068	97 11 29	2072	95 19 47	2077
2	Sun	W.	32 6 33	2353	33 51 16	2362	35 35 46	2371	37 20 2	2381
	Mars	E.	35 39 1	2257	33 51 58	2270	32 5 14	2284	30 18 51	2299
	Spica	E.	40 9 34	2107	38 18 45	2121	36 28 18	2136	34 38 14	2153
	Antares	E.	86 3 43	2116	84 13 8	2126	82 22 48	2136	80 32 44	2148
3	Sun	W.	45 57 21	2443	47 39 54	2457	49 22 8	2471	51 4 2	2486
	Antares	E.	71 27 5	2214	69 38 59	2230	67 51 16	2245	66 3 56	2262
	α Aquilæ	E.	117 33 30	2744	115 57 49	2739	114 22 1	2736	112 46 9	2735
4	Sun	W.	59 28 10	2565	61 7 53	2582	62 47 13	2599	64 26 10	2616
	Antares	E.	57 13 33	2352	55 28 49	2371	53 44 33	2392	52 0 47	2413
	α Aquilæ	E.	104 47 20	2756	103 11 55	2766	101 36 42	2775	100 1 41	2785
5	Sun	W.	72 35 4	2702	74 11 41	2719	75 47 55	2738	77 23 45	2755
	Jupiter	W.	22 25 32	2447	24 8 0	2463	25 50 5	2479	27 31 48	2495
	Antares	E.	43 29 46	2530	41 49 14	2556	40 9 19	2584	38 30 2	2613
	α Aquilæ	E.	92 10 32	2853	90 37 13	2869	89 4 15	2887	87 31 39	2904
6	Sun	W.	85 17 12	2842	86 50 46	2858	88 23 59	2875	89 56 50	2892
	Jupiter	W.	35 54 42	2576	37 34 10	2592	39 13 16	2608	40 52 0	2624
	Mars	W.	19 32 43	2798	21 7 14	2804	22 41 37	2811	24 15 50	2821
	Spica	W.	18 9 56	2736	19 45 50	2718	21 22 4	2707	22 58 34	2702
	α Aquilæ	E.	79 54 30	3002	78 24 20	3023	76 54 36	3046	75 25 20	3069
7	Sun	W.	97 35 49	2972	99 6 37	2988	100 37 5	3002	102 7 15	3018
	Jupiter	W.	49 0 28	2699	50 37 9	2713	52 13 31	2728	53 49 34	2741
	Mars	W.	32 3 29	2879	33 36 15	2892	35 8 44	2905	36 40 57	2917
	Spica	W.	31 1 17	2719	32 37 31	2727	34 13 35	2735	35 49 28	2744
	α Aquilæ	E.	68 6 24	3197	66 40 11	3225	65 14 31	3254	63 49 26	3284
	Fomalhaut	E.	100 56 45	2964	99 25 47	2975	97 55 3	2987	96 24 34	2998
8	Sun	W.	109 33 31	3088	111 1 55	3101	112 30 3	3114	113 57 55	3127
	Jupiter	W.	61 45 18	2808	63 19 35	2821	64 53 36	2833	66 27 21	2845
	Mars	W.	44 18 1	2980	45 48 39	2992	47 19 2	3004	48 49 10	3015
	Spica	W.	43 45 53	2792	45 20 32	2802	46 54 57	2812	48 29 9	2821
	α Aquilæ	E.	56 53 20	3458	55 32 9	3497	54 11 42	3540	52 52 2	3586
	Fomalhaut	E.	88 55 53	3060	87 26 55	3074	85 58 14	3087	84 29 49	3101
9	Sun	W.	121 18 31	3186	122 39 57	3198	124 6 9	3208	125 32 9	3219
	Jupiter	W.	74 12 23	2901	75 44 41	2911	77 16 46	2920	78 48 39	2931
	Spica	W.	56 17 4	2869	57 50 2	2878	59 22 49	2887	60 55 25	2895
	Mars	W.	56 16 18	3071	57 45 3	3081	59 13 36	3091	60 41 56	3101
	α Aquilæ	E.	46 26 54	3858	45 12 52	3925	43 59 58	3999	42 48 17	4077
	Fomalhaut	E.	77 11 51	3171	75 45 7	3185	74 18 40	3200	72 52 31	3216
10	Jupiter	W.	86 25 3	2975	87 55 47	2983	89 26 21	2991	90 56 45	2999
	Spica	W.	68 35 42	2936	70 7 15	2943	71 38 39	2950	73 9 54	2958

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Sun	W.	25° 5′ 59″	2326	26° 51′ 20″	2331	28° 36′ 34″	2337	30° 21′ 39″	2345
	Mars	E.	42 49 54	2916	41 1 50	2925	39 13 59	2934	37 26 22	2945
	Spica	E.	47 35 54	2061	45 43 54	2071	43 52 10	2082	42 0 43	2094
	Antares	E.	93 28 13	2083	91 36 48	2090	89 45 34	2098	87 54 32	2107
2	Sun	W.	39 4 4	2392	40 47 50	2404	42 31 19	2417	44 14 29	2430
	Mars	E.	28 32 50	2315	26 47 13	2333	25 2 2	2353	23 17 20	2375
	Spica	E.	32 48 36	2172	30 59 27	2193	29 10 49	2216	27 22 45	2241
	Antares	E.	78 42 58	2160	76 53 30	2172	75 4 21	2186	73 15 32	2200
3	Sun	W.	52 45 35	2501	54 26 47	2517	56 7 37	2533	57 48 5	2549
	Antares	E.	64 17 0	2279	62 30 29	2296	60 44 24	2314	58 58 45	2333
	α Aquilæ	E.	111 10 16	2736	109 34 24	2739	107 58 36	2744	106 22 54	2750
4	Sun	W.	66 4 43	2633	67 42 53	2650	69 20 40	2667	70 58 4	2685
	Antares	E.	50 17 31	2435	48 34 46	2458	46 52 33	2481	45 10 53	2504
	α Aquilæ	E.	98 26 54	2797	96 52 22	2810	95 18 7	2824	93 44 10	2838
5	Sun	W.	78 59 12	2772	80 34 16	2790	82 8 57	2807	83 43 16	2825
	Jupiter	W.	29 13 8	2512	30 54 5	2527	32 34 40	2544	34 14 52	2560
	Antares	E.	36 51 25	2644	35 13 30	2677	33 36 19	2712	31 59 55	2750
	α Aquilæ	E.	85 59 25	2922	84 27 34	2942	82 56 8	2961	81 25 6	2981
6	Sun	W.	91 29 19	2909	93 1 27	2924	94 33 15	2941	96 4 42	2957
	Jupiter	W.	42 30 23	2639	44 8 25	2655	45 46 6	2669	47 23 27	2684
	Mars	W.	25 49 51	2831	27 23 38	2843	28 57 10	2855	30 30 27	2866
	Spica	W.	24 35 11	2701	26 11 49	2704	27 48 24	2707	29 24 54	2713
	α Aquilæ	E.	73 56 33	3093	72 28 15	3118	71 0 27	3143	69 33 10	3169
7	Sun	W.	103 37 6	3032	105 6 39	3047	106 35 54	3061	108 4 51	3075
	Jupiter	W.	55 25 19	2756	57 0 45	2769	58 35 53	2782	60 10 44	2795
	Mars	W.	38 12 54	2931	39 44 34	2942	41 15 59	2955	42 47 8	2968
	Spica	W.	37 25 10	2753	39 0 40	2763	40 35 57	2772	42 11 2	2782
	α Aquilæ	E.	62 24 56	3316	61 1 3	3350	59 37 49	3384	58 15 14	3420
	Fomalhaut	E.	94 54 19	3010	93 24 19	3023	91 54 35	3035	90 25 6	3048
8	Sun	W.	115 25 32	3140	116 52 53	3152	118 20 0	3164	119 46 52	3175
	Jupiter	W.	68 0 51	2856	69 34 6	2868	71 7 6	2879	72 39 52	2891
	Mars	W.	50 19 4	3027	51 48 43	3039	53 18 8	3049	54 47 20	3060
	Spica	W.	50 3 9	2831	51 36 56	2841	53 10 31	2850	54 43 54	2860
	α Aquilæ	E.	51 33 12	3633	50 15 13	3683	48 58 8	3738	47 42 1	3795
	Fomalhaut	E.	83 1 40	3114	81 33 48	3128	80 6 12	3142	78 38 53	3156
9	Sun	W.	126 57 56	3229	128 23 31	3239	129 48 54	3248	131 14 7	3257
	Jupiter	W.	80 20 19	2940	81 51 47	2950	83 23 3	2958	84 54 8	2966
	Spica	W.	62 27 50	2904	64 0 4	2912	65 32 7	2920	67 4 0	2929
	Mars	W.	62 10 5	3110	63 38 2	3120	65 5 47	3129	66 33 21	3138
	α Aquilæ	E.	41 37 53	4163	40 28 52	4258	39 21 20	4362	38 15 24	4476
	Fomalhaut	E.	71 26 41	3231	70 1 9	3247	68 35 56	3265	67 11 3	3281
10	Jupiter	W.	92 26 59	3006	93 57 4	3014	95 27 0	3021	96 56 47	3027
	Spica	W.	74 40 59	2965	76 11 55	2972	77 42 43	2978	79 13 23	2984

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
10	**Mars**	W.	68 0 45	3147	69 27 58	3155	70 55 1	3163	72 21 55	3170
	Antares	W.	24 15 21	3299	25 39 34	3265	27 4 26	3238	28 29 50	3217
	Fomalhaut	E.	65 46 29	3298	64 22 15	3316	62 58 22	3335	61 34 51	3354
	α Pegasi	E.	80 14 26	3310	78 48 29	3321	77 22 45	3332	75 57 14	3344
11	**Jupiter**	W.	98 26 26	3034	99 55 57	3039	101 25 21	3046	102 54 37	3052
	Spica	W.	80 43 56	2990	82 14 21	2997	83 44 38	3002	85 14 48	3007
	Mars	W.	79 34 9	3906	81 0 11	3913	82 26 5	3920	83 51 51	3925
	Antares	W.	35 41 53	3155	37 8 56	3148	38 36 7	3143	40 3 24	3138
	Fomalhaut	E.	54 43 10	3466	53 22 8	3491	52 1 34	3519	50 41 31	3549
	α Pegasi	E.	68 53 12	3306	67 29 8	3319	66 5 19	3334	64 41 47	3349
12	Spica	W.	92 44 1	3033	94 13 33	3037	95 43 0	3042	97 12 21	3046
	Antares	W.	47 20 50	3198	48 48 26	3197	50 16 3	3197	51 43 40	3196
	Fomalhaut	E.	44 10 9	3733	42 53 57	3779	41 38 33	3829	40 24 1	3885
	α Pegasi	E.	57 48 33	3432	56 26 53	3452	55 5 35	3471	53 44 39	3494
	α Arietis	E.	100 23 25	3155	98 56 22	3158	97 29 22	3161	96 2 26	3164
13	Antares	W.	59 1 49	3197	60 29 26	3198	61 57 2	3198	63 24 38	3199
	Fomalhaut	E.	34 27 25	4267	33 20 2	4378	32 14 15	4491	31 10 15	4605
	α Pegasi	E.	47 6 38	3628	45 48 34	3662	44 31 6	3698	43 14 17	3738
	α Arietis	E.	88 48 45	3180	87 22 12	3184	85 55 44	3188	84 29 20	3191
14	Antares	W.	70 42 25	3132	72 9 56	3132	73 37 27	3132	75 4 58	3133
	α Aquilæ	W.	32 45 22	5299	33 38 30	5127	34 33 47	4974	35 31 3	4838
	α Arietis	E.	77 18 20	3906	75 52 20	3911	74 26 24	3915	73 0 33	3919
15	Antares	W.	82 22 26	3133	83 49 55	3133	85 17 24	3133	86 44 53	3133
	α Aquilæ	W.	40 41 59	4342	41 48 13	4269	42 55 34	4203	44 3 57	4144
	α Arietis	E.	65 52 26	3940	64 27 4	3944	63 1 47	3948	61 36 35	3953
	Aldebaran	E.	97 44 46	3069	96 15 58	3069	94 47 10	3069	93 18 22	3069
16	Antares	W.	94 2 28	3130	95 30 1	3129	96 57 35	3128	98 25 11	3127
	α Aquilæ	W.	49 58 43	3913	51 11 50	3876	52 25 34	3843	53 39 52	3812
	α Arietis	E.	54 32 13	3284	53 7 43	3292	51 43 22	3300	50 19 10	3308
	Aldebaran	E.	85 54 16	3065	84 25 24	3064	82 56 31	3063	81 27 36	3060
17	α Aquilæ	W.	59 58 43	3685	61 15 46	3663	62 33 12	3644	63 50 59	3626
	α Arietis	E.	43 21 2	3366	41 58 7	3383	40 35 31	3401	39 13 16	3421
	Aldebaran	E.	74 2 22	3049	72 33 10	3047	71 3 55	3043	69 34 36	3039
18	α Aquilæ	W.	70 24 35	3545	71 44 10	3530	73 4 1	3516	74 24 7	3504
	Fomalhaut	W.	37 42 0	3950	38 54 29	3887	40 8 2	3828	41 22 35	3775
	α Pegasi	W.	25 57 2	5177	26 51 41	4954	27 49 13	4760	28 49 22	4592
	Aldebaran	E.	62 6 47	3018	60 36 57	3013	59 7 0	3007	57 36 56	3001
19	Fomalhaut	W.	47 47 59	3563	49 7 14	3528	50 27 7	3496	51 47 36	3465
	α Pegasi	W.	34 21 50	4005	35 33 25	3922	36 46 22	3848	38 0 35	3780
	Aldebaran	E.	50 4 42	2968	48 33 49	2961	47 2 47	2953	45 31 35	2945
	Saturn	E.	89 42 46	3018	88 12 55	3009	86 42 54	3001	85 12 43	2993
	Pollux	E.	94 1 7	3040	92 31 44	3033	91 2 12	3026	89 32 31	3018
	Venus	E.	101 35 55	3436	100 14 18	3426	98 52 31	3416	97 30 33	3407

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
10	**Mars**	W.	73° 48′ 40″	3178	75° 15′ 15″	3186	76° 41′ 41″	3193	78° 7′ 59″	3199
	Antares	W.	29 55 39	3199	31 21 49	3184	32 48 17	3173	34 14 59	3163
	Fomalhaut	E.	60 11 42	3375	58 48 57	3396	57 26 36	3418	56 4 40	3441
	α Pegasi	E.	74 31 57	3956	73 6 54	3968	71 42 5	3981	70 17 31	3994
11	**Jupiter**	W.	104 23 46	3057	105 52 48	3062	107 21 44	3068	108 50 33	3073
	Spica	W.	86 44 52	3013	88 14 49	3018	89 44 39	3023	91 14 23	3028
	Mars	W.	85 17 30	3931	86 43 2	3936	88 8 28	3942	89 33 48	3947
	Antares	W.	41 30 47	3135	42 58 14	3133	44 25 44	3131	45 53 16	3129
	Fomalhaut	E.	49 22 1	3580	48 3 5	3614	46 44 46	3650	45 27 6	3691
	α Pegasi	E.	63 18 32	3365	61 55 35	3379	60 32 55	3396	59 10 34	3414
12	Spica	W.	98 41 37	3050	100 10 48	3053	101 39 55	3057	103 8 57	3061
	Antares	W.	53 11 18	3196	54 38 56	3196	56 6 34	3196	57 34 12	3197
	Fomalhaut	E.	39 10 26	3946	37 57 53	4015	36 46 28	4089	35 36 16	4174
	α Pegasi	E.	52 24 8	3517	51 4 3	3542	49 44 25	3568	48 25 16	3597
	α Arietis	E.	94 35 34	3168	93 8 46	3171	91 42 2	3174	90 15 22	3177
13	Antares	W.	64 52 13	3129	66 19 47	3130	67 47 20	3130	69 14 53	3131
	Fomalhaut	E.	30 8 12	4778	29 8 18	4955	28 10 47	5158	27 15 54	5393
	α Pegasi	E.	41 58 10	3782	40 42 49	3829	39 28 17	3862	38 14 39	3940
	α Arietis	E.	83 3 0	3194	81 36 44	3198	80 10 32	3201	78 44 24	3204
14	Antares	W.	76 32 28	3133	77 59 58	3133	79 27 28	3133	80 54 57	3133
	α Aquilæ	W.	36 30 8	4716	37 30 54	4607	38 33 13	4509	39 36 57	4421
	α Arietis	E.	71 34 46	3923	70 9 4	3926	68 43 26	3931	67 17 53	3936
15	Antares	W.	88 12 23	3133	89 39 53	3132	91 7 24	3131	92 34 56	3131
	α Aquilæ	W.	45 13 16	4089	46 23 28	4039	47 34 29	3993	48 46 15	3951
	α Arietis	E.	60 11 29	3959	58 46 30	3965	57 21 37	3970	55 56 51	3977
	Aldebaran	E.	91 49 34	3069	90 20 46	3068	88 51 57	3067	87 23 7	3066
16	Antares	W.	99 52 48	3196	101 20 26	3194	102 48 6	3193	104 15 48	3191
	α Aquilæ	W.	54 54 42	3783	56 10 2	3756	57 25 50	3731	58 42 4	3708
	α Arietis	E.	48 55 8	3318	47 31 17	3328	46 7 38	3340	44 44 13	3359
	Aldebaran	E.	79 58 38	3059	78 29 38	3057	77 0 36	3055	75 31 31	3051
17	α Aquilæ	W.	65 9 5	3609	66 27 30	3591	67 46 14	3575	69 5 16	3559
	α Arietis	E.	37 51 23	3444	36 29 56	3470	35 8 58	3498	33 48 32	3532
	Aldebaran	E.	68 5 12	3035	66 35 43	3032	65 6 10	3027	63 36 31	3023
18	α Aquilæ	W.	75 44 27	3491	77 5 1	3479	78 25 49	3466	79 46 51	3454
	Fomalhaut	W.	42 38 3	3726	43 54 23	3680	45 11 31	3638	46 29 24	3599
	α Pegasi	W.	29 51 54	4444	30 56 36	4314	32 3 16	4198	33 11 44	4096
	Aldebaran	E.	56 6 45	2996	54 36 27	2989	53 6 1	2982	51 35 26	2975
19	Fomalhaut	W.	53 8 39	3437	54 30 14	3409	55 52 20	3382	57 14 57	3357
	α Pegasi	W.	39 15 58	3718	40 32 26	3663	41 49 53	3610	43 8 16	3562
	Aldebaran	E.	44 0 13	2936	42 28 40	2927	40 56 55	2918	39 24 59	2908
	Saturn	E.	83 42 21	2984	82 11 48	2975	80 41 4	2966	79 10 9	2957
	Pollux	E.	88 2 40	3009	86 32 38	3000	85 2 25	2991	83 32 1	2981
	Venus	E.	96 8 24	3398	94 46 5	3388	93 23 35	3378	92 0 53	3367

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh	P. L. of Diff.
19	Sun	E.	128° 17′ 49″	3328	126° 54′ 10″	3319	125° 30′ 21″	3311	124° 6′ 22″	3301
20	Fomalhaut	W.	58 38 3	3332	60 1 37	3309	61 25 38	3286	62 50 6	3265
	α Pegasi	W.	44 27 32	3517	45 47 37	3475	47 8 29	3436	48 30 5	3399
	Aldebaran	E.	37 52 50	2898	36 20 29	2888	34 47 55	2877	33 15 7	2866
	Saturn	E.	77 39 2	2946	76 7 42	2936	74 36 9	2925	73 4 22	2915
	Pollux	E.	82 1 25	2973	80 30 38	2963	78 59 39	2953	77 28 27	2942
	Venus	E.	90 37 59	3357	89 14 53	3345	87 51 33	3332	86 27 59	3320
	Sun	E.	117 3 40	3251	115 38 31	3240	114 13 9	3229	112 47 34	3217
21	Fomalhaut	W.	69 58 43	3161	71 25 39	3141	72 52 59	3122	74 20 42	3103
	α Pegasi	W.	55 28 2	3238	56 53 26	3210	58 19 23	3183	59 45 53	3157
	Saturn	E.	65 21 53	2855	63 48 36	2842	62 15 3	2828	60 41 12	2815
	Pollux	E.	69 49 10	2890	68 16 38	2878	66 43 51	2867	65 10 50	2856
	Venus	E.	79 26 30	3254	78 1 25	3240	76 36 3	3225	75 10 24	3210
	Sun	E.	105 35 56	3152	104 8 49	3137	102 41 24	3123	101 13 42	3109
22	Fomalhaut	W.	81 44 57	3012	83 14 55	2994	84 45 15	2977	86 15 56	2960
	α Pegasi	W.	67 6 4	3034	68 35 35	3011	70 5 34	2989	71 36 1	2966
	α Arietis	W.	24 30 0	3618	25 48 15	3499	27 8 40	3396	28 31 1	3306
	Saturn	E.	52 47 30	2744	51 11 49	2729	49 35 48	2714	47 59 27	2698
	Pollux	E.	57 22 4	2798	55 47 33	2787	54 12 48	2776	52 37 49	2765
	Venus	E.	67 57 32	3130	66 29 59	3114	65 2 6	3096	63 33 52	3078
	Sun	E.	93 50 35	3030	92 20 59	3013	90 51 2	2996	89 20 44	2978
23	α Pegasi	W.	79 15 6	2861	80 48 15	2842	82 21 49	2821	83 55 49	2802
	α Arietis	W.	35 45 22	2985	37 15 53	2937	38 47 25	2892	40 19 54	2850
	Saturn	E.	39 52 28	2621	38 14 1	2604	36 35 12	2589	34 56 2	2574
	Pollux	E.	44 39 25	2716	43 3 7	2710	41 26 40	2704	39 50 5	2698
	Venus	E.	56 7 14	2989	54 36 47	2970	53 5 57	2951	51 34 43	2932
	Sun	E.	81 43 42	2889	80 11 9	2870	78 38 12	2852	77 4 51	2832
24	α Arietis	W.	48 14 54	2674	49 52 9	2643	51 30 5	2614	53 8 41	2586
	Venus	E.	43 52 31	2837	42 18 51	2818	40 44 47	2800	39 10 19	2781
	Sun	E.	69 11 53	2737	67 36 2	2718	65 59 46	2698	64 23 4	2679
25	α Arietis	W.	61 30 51	2460	63 13 0	2438	64 55 41	2415	66 38 54	2394
	Aldebaran	W.	27 46 13	2980	29 32 42	2963	31 19 36	2946	33 6 55	2929
	Venus	E.	31 11 56	2692	29 35 6	2676	27 57 54	2660	26 20 21	2645
	Sun	E.	56 13 6	2585	54 33 50	2566	52 54 9	2548	51 14 3	2530
26	α Arietis	W.	75 22 15	2299	77 8 16	2283	78 54 41	2266	80 41 30	2251
	Aldebaran	W.	42 9 37	2151	43 59 19	2136	45 49 24	2121	47 39 51	2107
	Sun	E.	42 47 24	2445	41 4 54	2430	39 22 2	2415	37 38 48	2400
27	α Arietis	W.	89 40 53	2187	91 29 40	2177	93 18 42	2167	95 7 59	2159
	Aldebaran	W.	56 57 6	2047	58 49 27	2036	60 42 5	2026	62 34 58	2017
	Sun	E.	28 57 39	2335	27 12 31	2324	25 27 6	2313	23 41 26	2304
31	Sun	W.	27 46 34	2373	29 30 48	2387	31 14 42	2401	32 58 16	2416
	Antares	E.	62 53 25	2165	61 4 4	2180	59 15 7	2197	57 26 35	2215
	α Aquilæ	E.	109 53 39	2609	108 14 56	2610	106 36 15	2614	104 57 39	2620

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
19	**Sun**	E.	122° 42′ 12″	3993	121° 17′ 52″	3988	119° 53′ 20″	3979	118° 28′ 36″	3969
20	Fomalhaut	W.	64 14 59	3243	65 40 17	3221	67 6 1	3200	68 32 10	3180
	α Pegasi	W.	49 52 23	3363	51 15 22	3330	52 38 59	3298	54 3 13	3268
	Aldebaran	E.	31 42 4	2855	30 8 47	2843	28 35 15	2831	27 1 28	2819
	Saturn	E.	71 32 22	2904	70 0 8	2892	68 27 39	2880	66 54 54	2867
	Pollux	E.	75 57 2	2932	74 25 24	2922	72 53 33	2911	71 21 28	2901
	Venus	E.	85 4 11	3308	83 40 9	3295	82 15 52	3282	80 51 19	3268
	Sun	E.	111 21 45	3204	109 55 41	3192	108 29 22	3178	107 2 47	3165
21	Fomalhaut	W.	75 48 48	3084	77 17 17	3066	78 46 8	3048	80 15 21	3030
	α Pegasi	W.	61 12 54	3131	62 40 26	3105	64 8 29	3081	65 37 2	3057
	Saturn	E.	59 7 4	2801	57 32 38	2788	55 57 54	2773	54 22 51	2760
	Pollux	E.	63 37 35	2845	62 4 5	2833	60 30 20	2821	58 56 20	2809
	Venus	E.	73 44 27	3195	72 18 12	3179	70 51 38	3163	69 24 45	3147
	Sun	E.	99 45 43	3093	98 17 25	3078	96 48 48	3061	95 19 51	3046
22	Fomalhaut	W.	87 46 59	2942	89 18 24	2926	90 50 10	2910	92 22 16	2894
	α Pegasi	W.	73 6 56	2945	74 38 18	2924	76 10 7	2902	77 42 23	2881
	α Arietis	W.	29 55 5	3228	31 20 41	3158	32 47 40	3095	34 15 56	3038
	Saturn	E.	46 22 45	2684	44 45 43	2667	43 8 19	2652	41 30 34	2636
	Pollux	E.	51 2 35	2754	49 27 7	2744	47 51 26	2735	46 15 32	2725
	Venus	E.	62 5 16	3061	60 36 19	3043	59 7 0	3025	57 37 18	3007
	Sun	E.	87 50 4	2961	86 19 2	2943	84 47 38	2925	83 15 51	2908
23	α Pegasi	W.	85 30 14	2783	87 5 4	2765	88 40 18	2747	90 15 56	2729
	α Arietis	W.	41 53 17	2811	43 27 31	2774	45 2 33	2739	46 38 21	2705
	Saturn	E.	33 16 31	2559	31 36 39	2543	29 56 26	2529	28 15 53	2515
	Pollux	E.	38 13 23	2695	36 36 37	2696	34 59 50	2697	33 23 6	2701
	Venus	E.	50 3 5	2913	48 31 3	2894	46 58 37	2875	45 25 46	2856
	Sun	E.	75 31 5	2813	73 56 54	2795	72 22 19	2775	70 47 19	2756
24	α Arietis	W.	54 47 55	2559	56 27 46	2533	58 8 13	2508	59 49 15	2484
	Venus	E.	37 35 26	2763	36 0 9	2744	34 24 28	2727	32 48 24	2709
	Sun	E.	62 45 56	2660	61 8 22	2640	59 30 22	2622	57 51 57	2603
25	α Arietis	W.	68 22 37	2373	70 6 50	2354	71 51 31	2335	73 36 40	2317
	Aldebaran	W.	34 54 39	2213	36 42 47	2196	38 31 20	2180	40 20 17	2165
	Venus	E.	24 42 27	2631	23 4 14	2618	21 25 44	2608	19 47 0	2601
	Sun	E.	49 33 31	2512	47 52 35	2495	46 11 15	2478	44 29 31	2462
26	α Arietis	W.	82 28 42	2237	84 16 15	2223	86 4 9	2210	87 52 22	2198
	Aldebaran	W.	49 30 39	2094	51 21 47	2081	53 13 15	2069	55 5 2	2058
	Sun	E.	35 55 13	2386	34 11 18	2372	32 27 3	2359	30 42 30	2347
27	α Arietis	W.	96 57 29	2151	98 47 10	2145	100 37 0	2141	102 26 57	2137
	Aldebaran	W.	64 28 5	2009	66 21 25	2001	68 14 57	1994	70 8 41	1987
	Sun	E.	21 55 32	2295	20 9 25	2287	18 23 6	2279	16 36 36	2272
31	**Sun**	W.	34 41 28	2431	36 24 18	2447	38 6 46	2464	39 48 50	2480
	Antares	E.	55 38 30	2233	53 50 52	2253	52 3 43	2274	50 17 5	2296
	α Aquilæ	E.	103 19 11	2626	101 40 52	2635	100 2 44	2645	98 24 50	2656

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Wed.	1	10 42 9.45	9.073	N. 8 13 26.7	−54.52	15 53.72	64.41	0 7.93	0.781
Thur.	2	10 45 47.05	9.060	7 51 34.3	54.85	15 53.96	64.37	0 26.84	0.794
Frid.	3	10 49 24.35	9.049	7 29 34.2	55.16	15 54.20	64.33	0 46.03	0.805
Sat.	4	10 53 1.39	9.038	7 7 26.9	−55.45	15 54.44	64.29	1 5.49	0.816
SUN.	5	10 56 38.17	9.027	6 45 12.8	55.73	15 54.68	64.25	1 25.21	0.827
Mon.	6	11 0 14.70	9.017	6 22 52.2	56.01	15 54.93	64.22	1 45.18	0.837
Tues.	7	11 3 51.00	9.008	6 0 25.2	−56.25	15 55.18	64.19	2 5.37	0.846
Wed.	8	11 7 27.11	9.000	5 37 52.3	56.49	15 55.43	64.16	2 25.76	0.854
Thur.	9	11 11 3.03	8.993	5 15 13.8	56.72	15 55.68	64.14	2 46.33	0.861
Frid.	10	11 14 38.75	8.987	4 52 30.1	−56.93	15 55.93	64.12	3 7.08	0.867
Sat.	11	11 18 14.40	8.981	4 29 41.5	57.12	15 56.19	64.11	3 27.96	0.873
SUN.	12	11 21 49.90	8.976	4 6 48.2	57.31	15 56.45	64.09	3 48.96	0.878
Mon.	13	11 25 25.29	8.973	3 43 50.5	−57.48	15 56.71	64.08	4 10.05	0.881
Tues.	14	11 29 0.61	8.971	3 20 48.7	57.64	15 56.96	64.07	4 31.22	0.883
Wed.	15	11 32 35.89	8.970	2 57 43.3	57.79	15 57.22	64.07	4 52.44	0.884
Thur.	16	11 36 11.15	8.970	2 34 34.5	−57.92	15 57.48	64.06	5 13.68	0.884
Frid.	17	11 39 46.40	8.970	2 11 22.7	58.04	15 57.74	64.06	5 34.92	0.884
Sat.	18	11 43 21.68	8.971	1 48 8.1	58.15	15 58.00	64.06	5 56.14	0.883
SUN.	19	11 46 57.00	8.973	1 24 51.1	−58.25	15 58.26	64.06	6 17.31	0.881
Mon.	20	11 50 32.38	8.976	1 1 32.0	58.33	15 58.52	64.07	6 38.43	0.878
Tues.	21	11 54 7.84	8.980	0 38 11.1	58.40	15 58.78	64.08	6 59.47	0.874
Wed.	22	11 57 43.41	8.985	N. 0 14 48.7	−58.45	15 59.04	64.09	7 20.39	0.869
Thur.	23	12 1 19.10	8.991	S. 0 8 34.8	58.49	15 59.31	64.11	7 41.18	0.863
Frid.	24	12 4 54.94	8.997	0 31 59.0	58.51	15 59.57	64.13	8 1.83	0.857
Sat.	25	12 8 30.95	9.004	0 55 23.6	−58.52	15 59.84	64.16	8 22.32	0.850
SUN.	26	12 12 7.14	9.012	1 18 48.3	58.51	16 0.11	64.19	8 42.63	0.842
Mon.	27	12 15 43.52	9.021	1 42 12.6	58.49	16 0.38	64.22	9 2.74	0.833
Tues.	28	12 19 20.12	9.030	2 5 36.3	−58.45	16 0.65	64.25	9 22.63	0.824
Wed.	29	12 22 56.96	9.040	2 28 58.8	58.40	16 0.93	64.29	9 42.29	0.814
Thur.	30	12 26 34.04	9.051	2 52 19.9	58.33	16 1.21	64.33	10 1.71	0.803
Frid.	31	12 30 11.38	9.062	S. 3 15 39.2	−58.26	16 1.49	64.37	10 20.87	0.792

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^{s}.18$ from the sidereal time.
The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations, increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Wed.	1	10 42 9.46	9.075	N. 8 13 26.7	−54.53	0 7.93	0.781	10 42 17.39
Thur.	2	10 45 47.11	9.062	7 51 34.0	54.86	0 26.84	0.794	10 46 13.95
Frid.	3	10 49 24.46	9.051	7 29 33.6	55.17	0 46.04	0.805	10 50 10.50
Sat.	4	10 53 1.55	9.040	7 7 26.0	−55.46	1 5.50	0.816	10 54 7.05
SUN.	5	10 56 38.38	9.029	6 45 11.6	55.74	1 25.22	0.827	10 58 3.60
Mon.	6	11 0 14.96	9.019	6 22 50.6	56.01	1 45.20	0.837	11 2 0.16
Tues.	7	11 3 51.31	9.010	6 0 23.3	−56.26	2 5.40	0.846	11 5 56.71
Wed.	8	11 7 27.47	9.002	5 37 50.1	56.50	2 25.79	0.854	11 9 53.26
Thur.	9	11 11 3.44	8.995	5 15 11.3	56.73	2 46.37	0.861	11 13 49.81
Frid.	10	11 14 39.24	8.989	4 52 27.2	−56.94	3 7.12	0.867	11 17 46.37
Sat.	11	11 18 14.91	8.983	4 29 38.2	57.14	3 28.01	0.873	11 21 42.92
SUN.	12	11 21 50.46	8.978	4 6 44.5	57.33	3 49.01	0.878	11 25 39.47
Mon.	13	11 25 25.91	8.975	3 43 46.5	−57.50	4 10.11	0.881	11 29 36.02
Tues.	14	11 29 1.28	8.973	3 20 44.4	57.66	4 31.29	0.883	11 33 32.57
Wed.	15	11 32 36.61	8.972	2 57 38.6	57.81	4 52.51	0.884	11 37 29.12
Thur.	16	11 36 11.92	8.972	2 34 29.5	−57.94	5 13.76	0.884	11 41 25.68
Frid.	17	11 39 47.23	8.972	2 11 17.3	58.06	5 35.00	0.884	11 45 22.23
Sat.	18	11 43 22.56	8.973	1 48 2.4	58.17	5 56.22	0.883	11 49 18.78
SUN.	19	11 46 57.93	8.975	1 24 45.0	−58.27	6 17.40	0.881	11 53 15.33
Mon.	20	11 50 33.36	8.978	1 1 25.5	58.35	6 38.52	0.878	11 57 11.88
Tues.	21	11 54 8.88	8.982	0 38 4.3	58.42	6 59.55	0.874	12 1 8.43
Wed.	22	11 57 44.50	8.987	N. 0 14 41.6	−58.47	7 20.49	0.869	12 5 4.99
Thur.	23	12 1 20.25	8.993	S. 0 8 42.2	58.51	7 41.29	0.863	12 9 1.54
Frid.	24	12 4 56.15	8.999	0 32 6.8	58.53	8 1.94	0.857	12 12 58.09
Sat.	25	12 8 32.21	9.006	0 55 31.8	−58.54	8 22.43	0.850	12 16 54.64
SUN.	26	12 12 8.45	9.014	1 18 56.8	58.53	8 42.75	0.842	12 20 51.20
Mon.	27	12 15 44.89	9.023	1 42 21.5	58.51	9 2.86	0.833	12 24 47.75
Tues.	28	12 19 21.54	9.032	2 5 45.5	−58.47	9 22.76	0.824	12 28 44.30
Wed.	29	12 22 58.43	9.042	2 29 8.3	58.42	9 42.42	0.814	12 32 40.85
Thur.	30	12 26 35.56	9.053	2 52 29.7	58.35	10 1.84	0.803	12 36 37.40
Frid.	31	12 30 12.95	9.064	S. 3 15 49.3	−58.27	10 21.00	0.793	12 40 33.95

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations, increasing.

Diff. for 1 Hour,
$+ 9^{s}.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	244	158 56 27.1	55 59.6	145.34	+ 0.63	0.0037554	-44.6	13 15 31.92
2	245	159 54 36.1	54 8.5	145.41	0.73	0.0036478	45.2	13 11 36.01
3	246	160 52 46.6	52 18.9	145.47	0.79	0.0035387	45.8	13 7 40.10
4	247	161 50 58.5	50 30.7	145.53	+ 0.83	0.0034282	-46.3	13 3 44.20
5	248	162 49 12.0	48 44.1	145.59	0.84	0.0033164	46.8	12 59 48.30
6	249	163 47 26.9	46 59.0	145.65	0.83	0.0032035	47.2	12 55 52.39
7	250	164 45 43.4	45 15.4	145.71	+ 0.79	0.0030897	-47.6	12 51 56.49
8	251	165 44 1.4	43 33.3	145.77	0.71	0.0029751	47.9	12 48 0.58
9	252	166 42 20.9	41 52.7	145.84	0.61	0.0028600	48.1	12 44 4.67
10	253	167 40 42.0	40 13.7	145.91	+ 0.49	0.0027444	-48.3	12 40 8.76
11	254	168 39 4.8	38 36.4	145.98	0.36	0.0026284	48.4	12 36 12.86
12	255	169 37 29.3	37 0.9	146.05	0.23	0.0025121	48.5	12 32 16.96
13	256	170 35 55.6	35 27.1	146.13	+ 0.10	0.0023955	-48.6	12 28 21.05
14	257	171 34 23.8	33 55.2	146.21	− 0.02	0.0022787	48.7	12 24 25.14
15	258	172 32 54.0	32 25.3	146.30	0.12	0.0021619	48.7	12 20 29.23
16	259	173 31 26.3	30 57.5	146.38	− 0.21	0.0020450	-48.8	12 16 33.33
17	260	174 30 0.7	29 31.8	146.47	0.28	0.0019280	48.8	12 12 37.42
18	261	175 28 37.1	28 8.2	146.56	0.31	0.0018107	49.0	12 8 41.51
19	262	176 27 15.7	26 46.7	146.65	− 0.30	0.0016931	-49.1	12 4 45.61
20	263	177 25 56.5	25 27.4	146.74	0.27	0.0015751	49.3	12 0 49.71
21	264	178 24 39.6	24 10.4	146.84	0.21	0.0014566	49.5	11 56 53.80
22	265	179 23 25.0	22 55.7	146.93	− 0.13	0.0013375	-49.8	11 52 57.89
23	266	180 22 12.6	21 43.3	147.03	− 0.03	0.0012176	50.1	11 49 1.99
24	267	181 21 2.5	20 33.1	147.12	+ 0.10	0.0010970	50.4	11 45 6.09
25	268	182 19 54.6	19 25.1	147.21	+ 0.23	0.0009756	-50.7	11 41 10.18
26	269	183 18 48.8	18 19.2	147.30	0.36	0.0008534	51.1	11 37 14.27
27	270	184 17 45.1	17 15.5	147.39	0.49	0.0007304	51.5	11 33 18.36
28	271	185 16 43.6	16 13.9	147.48	+ 0.62	0.0006064	-51.9	11 29 22.46
29	272	186 15 44.1	15 14.3	147.56	0.72	0.0004815	52.2	11 25 26.55
30	273	187 14 46.5	14 16.6	147.64	0.79	0.0003558	52.5	11 21 30.64
31	274	188 13 50.8	13 20.8	147.71	+ 0.83	0.0002294	-52.8	11 17 34.74

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0d.0.

Diff. for 1 Hour,
— 9s.8296.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 20.9	16 13.8	59 53.3	−2.09	59 27.2	−2.24	2 44.1	2.21	3.0
2	16 6.3	15 58.6	58 59.6	2.33	58 31.3	2.37	3 36.7	2.18	4.0
3	15 50.8	15 43.2	58 2.8	2.36	57 34.7	2.31	4 28.8	2.16	5.0
4	15 35.8	15 28.7	57 7.5	−2.22	56 41.5	−2.10	5 20.2	2.13	6.0
5	15 22.1	15 15.8	56 17.2	1.96	55 54.6	1.80	6 11.2	2.11	7.0
6	15 10.3	15 5.3	55 34.0	1.63	55 15.5	1.46	7 1.4	2.07	8.0
7	15 0.8	14 56.9	54 59.1	−1.28	54 44.9	−1.10	7 50.6	2.03	9.0
8	14 53.6	14 50.9	54 32.7	0.93	54 22.6	0.76	8 38.8	1.97	10.0
9	14 48.6	14 47.0	54 14.4	0.60	54 8.2	0.45	9 25.6	1.92	11.0
10	14 45.7	14 44.9	54 3.7	−0.31	54 0.8	−0.17	10 10.9	1.86	12.0
11	14 44.6	14 44.6	53 59.5	−0.05	53 59.7	+0.08	10 55.1	1.82	13.0
12	14 45.1	14 45.9	54 1.4	+0.19	54 4.3	0.30	11 38.3	1.79	14.0
13	14 47.0	14 48.5	54 8.5	+0.40	54 13.9	+0.50	12 21.1	1.78	15.0
14	14 50.3	14 52.4	54 20.5	0.60	54 28.3	0.70	13 4.0	1.79	16.0
15	14 54.9	14 57.7	54 37.4	0.80	54 47.7	0.91	13 47.4	1.83	17.0
16	15 0.8	15 4.3	54 59.2	+1.01	55 12.0	+1.12	14 32.0	1.89	18.0
17	15 8.2	15 12.4	55 26.1	1.23	55 41.5	1.34	15 18.3	1.98	19.0
18	15 16.9	15 21.9	55 58.3	1.46	56 16.5	1.57	16 7.0	2.08	20.0
19	15 27.2	15 32.9	56 36.0	+1.68	56 56.8	+1.78	16 58.2	2.19	21.0
20	15 38.8	15 45.0	57 18.7	1.86	57 41.5	1.93	17 52.0	2.29	22.0
21	15 51.4	15 58.0	58 5.0	1.98	58 29.0	2.00	18 47.9	2.37	23.0
22	16 4.5	16 10.8	58 52.9	+1.98	59 16.3	+1.92	19 45.2	2.41	24.0
23	16 17.0	16 22.7	59 38.9	1.82	59 59.9	1.66	20 43.1	2.41	25.0
24	16 27.9	16 32.2	60 18.8	1.46	60 34.9	1.21	21 40.6	2.38	26.0
25	16 35.7	16 38.2	60 47.7	+0.91	60 56.7	+0.58	22 37.4	2.34	27.0
26	16 39.5	16 39.6	61 1.5	+0.22	61 1.8	−0.16	23 33.1	2.30	28.0
27	16 38.4	16 36.0	60 57.6	−0.55	60 48.8	0.92	6		29.0
28	16 32.4	16 27.8	60 35.6	−1.26	60 18.5	−1.57	0 28.0	2.27	0.6
29	16 22.2	16 15.8	59 57.9	1.83	59 34.5	2.05	1 22.3	2.25	1.6
30	16 8.8	16 1.4	59 8.9	2.20	58 41.7	2.30	2 16.1	2.24	2.6
31	15 53.8	15 46.1	58 13.7	−2.34	57 45.5	−2.34	3 9.6	2.22	3.6

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 20 30.60	2.3033	S. 4 34 54.1	11.269
1	13 22 48.75	2.3017	4 46 9.0	11.227
2	13 25 6.81	2.3002	4 57 21.4	11.184
3	13 27 24.77	2.2986	5 8 31.1	11.139
4	13 29 42.64	2.2970	5 19 38.1	11.094
5	13 32 0.41	2.2954	5 30 42.4	11.048
6	13 34 18.09	2.2939	5 41 43.9	11.001
7	13 36 35.68	2.2924	5 52 42.5	10.952
8	13 38 53.18	2.2910	6 3 38.1	10.902
9	13 41 10.60	2.2896	6 14 30.7	10.851
10	13 43 27.93	2.2882	6 25 20.2	10.799
11	13 45 45.18	2.2867	6 36 6.6	10.747
12	13 48 2.34	2.2853	6 46 49.8	10.692
13	13 50 19.42	2.2840	6 57 29.7	10.637
14	13 52 36.42	2.2827	7 8 6.3	10.582
15	13 54 53.35	2.2815	7 18 39.5	10.525
16	13 57 10.20	2.2802	7 29 9.3	10.467
17	13 59 26.97	2.2788	7 39 35.6	10.409
18	14 1 43.66	2.2776	7 49 58.4	10.350
19	14 4 0.28	2.2764	8 0 17.6	10.289
20	14 6 16.83	2.2752	8 10 33.1	10.227
21	14 8 33.31	2.2741	8 20 44.9	10.165
22	14 10 49.72	2.2729	8 30 53.0	10.102
23	14 13 6.06	2.2718	S. 8 40 57.2	10.038

THURSDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 15 22.34	2.2707	S. 8 50 57.6	9.974
1	14 17 38.55	2.2696	9 0 54.1	9.908
2	14 19 54.69	2.2685	9 10 46.6	9.842
3	14 22 10.77	2.2674	9 20 35.1	9.775
4	14 24 26.78	2.2663	9 30 19.6	9.707
5	14 26 42.73	2.2653	9 39 59.9	9.638
6	14 28 58.62	2.2643	9 49 36.1	9.568
7	14 31 14.45	2.2633	9 59 8.1	9.498
8	14 33 30.22	2.2623	10 8 35.9	9.427
9	14 35 45.93	2.2614	10 17 59.4	9.356
10	14 38 1.59	2.2605	10 27 18.6	9.283
11	14 40 17.19	2.2595	10 36 33.4	9.210
12	14 42 32.73	2.2586	10 45 43.8	9.136
13	14 44 48.22	2.2577	10 54 49.7	9.061
14	14 47 3.65	2.2568	11 3 51.1	8.987
15	14 49 19.03	2.2559	11 12 48.1	8.911
16	14 51 34.36	2.2550	11 21 40.5	8.834
17	14 53 49.63	2.2541	11 30 28.2	8.757
18	14 56 4.85	2.2532	11 39 11.3	8.679
19	14 58 20.02	2.2524	11 47 49.7	8.601
20	15 0 35.14	2.2516	11 56 23.4	8.522
21	15 2 50.21	2.2507	12 4 52.4	8.443
22	15 5 5.23	2.2499	12 13 16.6	8.363
23	15 7 20.20	2.2492	12 21 35.9	8.282
24	15 9 35.13	2.2484	S. 12 29 50.4	8.201

FRIDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 9 35.13	2.2484	S. 12 29 50.4	8.201
1	15 11 50.01	2.2476	12 38 0.0	8.119
2	15 14 4.84	2.2468	12 46 4.7	8.037
3	15 16 19.62	2.2460	12 54 4.4	7.954
4	15 18 34.36	2.2452	13 1 59.2	7.871
5	15 20 49.05	2.2444	13 9 48.9	7.787
6	15 23 3.69	2.2437	13 17 33.6	7.702
7	15 25 18.29	2.2429	13 25 13.2	7.617
8	15 27 32.84	2.2422	13 32 47.7	7.532
9	15 29 47.35	2.2415	13 40 17.1	7.447
10	15 32 1.82	2.2407	13 47 41.3	7.361
11	15 34 16.24	2.2399	13 55 0.4	7.275
12	15 36 30.61	2.2392	14 2 14.3	7.188
13	15 38 44.94	2.2384	14 9 22.9	7.100
14	15 40 59.22	2.2377	14 16 26.3	7.012
15	15 43 13.46	2.2370	14 23 24.4	6.924
16	15 45 27.66	2.2362	14 30 17.2	6.836
17	15 47 41.81	2.2354	14 37 4.7	6.747
18	15 49 55.91	2.2347	14 43 46.9	6.658
19	15 52 9.97	2.2339	14 50 23.7	6.568
20	15 54 23.98	2.2332	14 56 55.1	6.478
21	15 56 37.95	2.2325	15 3 21.1	6.388
22	15 58 51.88	2.2317	15 9 41.7	6.297
23	16 1 5.76	2.2309	S. 15 15 56.8	6.207

SATURDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	16 3 19.59	2.2302	S. 15 22 6.5	6.116
1	16 5 33.38	2.2294	15 28 10.7	6.024
2	16 7 47.12	2.2286	15 34 9.4	5.933
3	16 10 0.81	2.2278	15 40 2.7	5.841
4	16 12 14.46	2.2271	15 45 50.4	5.748
5	16 14 28.06	2.2263	15 51 32.5	5.656
6	16 16 41.61	2.2254	15 57 9.1	5.563
7	16 18 55.11	2.2246	16 2 40.1	5.470
8	16 21 8.56	2.2238	16 8 5.5	5.378
9	16 23 21.96	2.2230	16 13 25.4	5.285
10	16 25 35.32	2.2222	16 18 39.7	5.191
11	16 27 48.63	2.2214	16 23 48.3	5.097
12	16 30 1.89	2.2206	16 28 51.3	5.003
13	16 32 15.10	2.2197	16 33 48.7	4.909
14	16 34 28.25	2.2188	16 38 40.4	4.814
15	16 36 41.35	2.2179	16 43 26.4	4.720
16	16 38 54.40	2.2170	16 48 6.8	4.626
17	16 41 7.39	2.2161	16 52 41.5	4.531
18	16 43 20.33	2.2152	16 57 10.5	4.436
19	16 45 33.21	2.2142	17 1 33.8	4.341
20	16 47 46.04	2.2133	17 5 51.4	4.247
21	16 49 58.81	2.2123	17 10 3.4	4.152
22	16 52 11.52	2.2114	17 14 9.6	4.056
23	16 54 24.18	2.2105	17 18 10.1	3.960
24	16 56 36.78	2.2095	S. 17 22 4.8	3.864

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 56 36.78	2.2095	S. 17 22 4.8	3.864
1	16 58 49.32	2.2085	17 25 53.8	3.769
2	17 1 1.80	2.2074	17 29 37.1	3.673
3	17 3 14.21	2.2063	17 33 14.6	3.577
4	17 5 26.56	2.2053	17 36 46.4	3.482
5	17 7 38.85	2.2043	17 40 12.5	3.387
6	17 9 51.08	2.2032	17 43 32.8	3.291
7	17 12 3.24	2.2022	17 46 47.4	3.195
8	17 14 15.34	2.2011	17 49 56.2	3.099
9	17 16 27.37	2.1999	17 52 59.3	3.003
10	17 18 39.33	2.1988	17 55 56.6	2.907
11	17 20 51.22	2.1977	17 58 48.2	2.812
12	17 23 3.05	2.1966	18 1 34.0	2.716
13	17 25 14.81	2.1953	18 4 14.1	2.620
14	17 27 26.49	2.1940	18 6 48.4	2.524
15	17 29 38.09	2.1928	18 9 17.0	2.429
16	17 31 49.62	2.1916	18 11 39.9	2.333
17	17 34 1.08	2.1904	18 13 57.0	2.237
18	17 36 12.47	2.1892	18 16 8.4	2.142
19	17 38 23.78	2.1878	18 18 14.1	2.047
20	17 40 35.01	2.1865	18 20 14.0	1.951
21	17 42 46.16	2.1852	18 22 8.2	1.856
22	17 44 57.23	2.1838	18 23 56.7	1.761
23	17 47 8.22	2.1825	S. 18 25 39.5	1.665

MONDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 49 19.13	2.1811	S. 18 27 16.5	1.570
1	17 51 29.95	2.1797	18 28 47.9	1.476
2	17 53 40.69	2.1783	18 30 13.6	1.381
3	17 55 51.35	2.1769	18 31 33.6	1.286
4	17 58 1.92	2.1754	18 32 47.9	1.192
5	18 0 12.40	2.1739	18 33 56.6	1.097
6	18 2 22.79	2.1725	18 34 59.6	1.002
7	18 4 33.10	2.1710	18 35 56.9	0.908
8	18 6 43.31	2.1694	18 36 48.6	0.815
9	18 8 53.43	2.1679	18 37 34.7	0.721
10	18 11 3.46	2.1663	18 38 15.2	0.627
11	18 13 13.39	2.1647	18 38 50.0	0.533
12	18 15 23.23	2.1632	18 39 19.2	0.440
13	18 17 32.97	2.1616	18 39 42.8	0.347
14	18 19 42.62	2.1600	18 40 0.8	0.254
15	18 21 52.17	2.1583	18 40 13.3	0.161
16	18 24 1.62	2.1567	18 40 20.2	− 0.069
17	18 26 10.97	2.1550	18 40 21.6	+ 0.022
18	18 28 20.22	2.1533	18 40 17.5	0.114
19	18 30 29.37	2.1516	18 40 7.9	0.207
20	18 32 38.41	2.1498	18 39 52.7	0.299
21	18 34 47.35	2.1481	18 39 32.0	0.390
22	18 36 56.18	2.1463	18 39 5.9	0.481
23	18 39 4.91	2.1446	18 38 34.3	0.572
24	18 41 13.53	2.1428	S. 18 37 57.2	0.663

TUESDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 41 13.53	2.1428	S. 18 37 57.2	0.663
1	18 43 22.04	2.1409	18 37 14.7	0.753
2	18 45 30.44	2.1392	18 36 26.8	0.843
3	18 47 38.74	2.1374	18 35 33.5	0.933
4	18 49 46.93	2.1355	18 34 34.8	1.023
5	18 51 55.00	2.1336	18 33 30.7	1.112
6	18 54 2.96	2.1317	18 32 21.3	1.201
7	18 56 10.81	2.1298	18 31 6.6	1.289
8	18 58 18.54	2.1279	18 29 46.6	1.378
9	19 0 26.16	2.1260	18 28 21.2	1.467
10	19 2 33.66	2.1240	18 26 50.5	1.555
11	19 4 41.04	2.1221	18 25 14.6	1.642
12	19 6 48.31	2.1202	18 23 33.5	1.729
13	19 8 55.46	2.1182	18 21 47.1	1.816
14	19 11 2.49	2.1162	18 19 55.5	1.902
15	19 13 9.40	2.1142	18 17 58.8	1.988
16	19 15 16.19	2.1122	18 15 56.9	2.075
17	19 17 22.86	2.1102	18 13 49.8	2.161
18	19 19 29.41	2.1081	18 11 37.6	2.246
19	19 21 35.83	2.1060	18 9 20.3	2.331
20	19 23 42.13	2.1040	18 6 57.9	2.415
21	19 25 48.31	2.1019	18 4 30.5	2.499
22	19 27 54.36	2.0998	18 1 58.0	2.583
23	19 30 0.29	2.0977	S. 17 59 20.5	2.667

WEDNESDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 32 6.09	2.0956	S. 17 56 38.0	2.750
1	19 34 11.76	2.0935	17 53 50.5	2.833
2	19 36 17.31	2.0914	17 50 58.1	2.915
3	19 38 22.73	2.0893	17 48 0.7	2.997
4	19 40 28.02	2.0872	17 44 58.4	3.079
5	19 42 33.19	2.0851	17 41 51.2	3.160
6	19 44 38.23	2.0829	17 38 39.2	3.241
7	19 46 43.14	2.0807	17 35 22.3	3.322
8	19 48 47.92	2.0785	17 32 0.6	3.402
9	19 50 52.56	2.0763	17 28 34.1	3.482
10	19 52 57.08	2.0742	17 25 2.8	3.561
11	19 55 1.47	2.0721	17 21 26.8	3.639
12	19 57 5.73	2.0699	17 17 46.1	3.718
13	19 59 9.86	2.0677	17 14 0.7	3.796
14	20 1 13.86	2.0655	17 10 10.6	3.874
15	20 3 17.72	2.0633	17 6 15.9	3.951
16	20 5 21.45	2.0611	17 2 16.5	4.027
17	20 7 25.05	2.0589	16 58 12.6	4.103
18	20 9 28.52	2.0567	16 54 4.1	4.180
19	20 11 31.86	2.0546	16 49 51.0	4.256
20	20 13 35.07	2.0523	16 45 33.4	4.330
21	20 15 38.14	2.0501	16 41 11.4	4.404
22	20 17 41.08	2.0479	16 36 44.9	4.478
23	20 19 43.89	2.0458	16 32 14.0	4.552
24	20 21 46.57	2.0436	S. 16 27 38.6	4.626

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 21 46.57	2.0436	S. 16 27 38.6	4.626
1	20 23 49.12	2.0413	16 22 58.8	4.699
2	20 25 51.53	2.0391	16 18 14.7	4.771
3	20 27 53.81	2.0369	16 13 26.3	4.842
4	20 29 55.96	2.0347	16 8 33.6	4.914
5	20 31 57.97	2.0325	16 3 36.6	4.985
6	20 33 59.86	2.0304	15 58 35.4	5.056
7	20 36 1.62	2.0282	15 53 29.9	5.126
8	20 38 3.24	2.0259	15 48 20.3	5.195
9	20 40 4.73	2.0237	15 43 6.5	5.264
10	20 42 6.09	2.0216	15 37 48.6	5.333
11	20 44 7.32	2.0195	15 32 26.6	5.401
12	20 46 8.43	2.0173	15 27 0.5	5.468
13	20 48 9.40	2.0151	15 21 30.4	5.535
14	20 50 10.24	2.0130	15 15 56.3	5.602
15	20 52 10.96	2.0109	15 10 18.1	5.669
16	20 54 11.55	2.0087	15 4 36.0	5.734
17	20 56 12.01	2.0066	14 58 50.0	5.800
18	20 58 12.34	2.0044	14 53 0.0	5.865
19	21 0 12.54	2.0023	14 47 6.1	5.929
20	21 2 12.62	2.0002	14 41 8.5	5.992
21	21 4 12.57	1.9981	14 35 7.1	6.055
22	21 6 12.39	1.9960	14 29 1.9	6.118
23	21 8 12.09	1.9940	S. 14 22 52.9	6.181

FRIDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	21 10 11.67	1.9919	S. 14 16 40.2	6.242
1	21 12 11.12	1.9898	14 10 23.8	6.303
2	21 14 10.45	1.9878	14 4 3.8	6.364
3	21 16 9.66	1.9858	13 57 40.1	6.425
4	21 18 8.75	1.9837	13 51 12.8	6.484
5	21 20 7.71	1.9817	13 44 42.0	6.542
6	21 22 6.55	1.9797	13 38 7.7	6.601
7	21 24 5.27	1.9777	13 31 29.9	6.659
8	21 26 3.88	1.9758	13 24 48.6	6.717
9	21 28 2.37	1.9739	13 18 3.8	6.775
10	21 30 0.75	1.9720	13 11 15.6	6.831
11	21 31 59.01	1.9700	13 4 24.1	6.887
12	21 33 57.15	1.9681	12 57 29.2	6.943
13	21 35 55.18	1.9662	12 50 31.0	6.998
14	21 37 53.10	1.9643	12 43 29.5	7.053
15	21 39 50.90	1.9624	12 36 24.7	7.106
16	21 41 48.59	1.9606	12 29 16.7	7.159
17	21 43 46.17	1.9588	12 22 5.6	7.212
18	21 45 43.65	1.9571	12 14 51.3	7.264
19	21 47 41.02	1.9552	12 7 33.9	7.316
20	21 49 38.28	1.9534	12 0 13.4	7.367
21	21 51 35.43	1.9517	11 52 49.8	7.418
22	21 53 32.48	1.9500	11 45 23.2	7.468
23	21 55 29.43	1.9482	11 37 53.6	7.518
24	21 57 26.27	1.9465	S. 11 30 21.0	7.568

SATURDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 57 26.27	1.9465	S. 11 30 21.0	7.568
1	21 59 23.01	1.9448	11 22 45.5	7.616
2	22 1 19.65	1.9432	11 15 7.1	7.663
3	22 3 16.20	1.9416	11 7 25.9	7.711
4	22 5 12.65	1.9400	10 59 41.8	7.758
5	22 7 9.00	1.9384	10 51 54.9	7.804
6	22 9 5.26	1.9369	10 44 5.3	7.850
7	22 11 1.43	1.9353	10 36 12.9	7.896
8	22 12 57.50	1.9337	10 28 17.8	7.940
9	22 14 53.48	1.9322	10 20 20.1	7.983
10	22 16 49.37	1.9308	10 12 19.8	8.027
11	22 18 45.18	1.9294	10 4 16.9	8.071
12	22 20 40.90	1.9280	9 56 11.3	8.114
13	22 22 36.54	1.9266	9 48 3.2	8.155
14	22 24 32.09	1.9252	9 39 52.7	8.196
15	22 26 27.56	1.9238	9 31 39.7	8.237
16	22 28 22.95	1.9225	9 23 24.3	8.277
17	22 30 18.26	1.9212	9 15 6.5	8.317
18	22 32 13.49	1.9199	9 6 46.2	8.357
19	22 34 8.65	1.9187	8 58 23.6	8.395
20	22 36 3.73	1.9174	8 49 58.8	8.432
21	22 37 58.74	1.9162	8 41 31.7	8.470
22	22 39 53.67	1.9150	8 33 2.4	8.507
23	22 41 48.54	1.9139	S. 8 24 30.9	8.543

SUNDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 43 43.34	1.9128	S. 8 15 57.2	8.579
1	22 45 38.08	1.9117	8 7 21.4	8.614
2	22 47 32.75	1.9106	7 58 43.5	8.648
3	22 49 27.35	1.9095	7 50 3.6	8.682
4	22 51 21.89	1.9086	7 41 21.7	8.716
5	22 53 16.38	1.9077	7 32 37.7	8.750
6	22 55 10.81	1.9067	7 23 51.7	8.782
7	22 57 5.18	1.9057	7 15 3.8	8.813
8	22 58 59.50	1.9048	7 6 14.1	8.844
9	23 0 53.76	1.9039	6 57 22.5	8.875
10	23 2 47.97	1.9032	6 48 29.1	8.905
11	23 4 42.14	1.9024	6 39 33.9	8.934
12	23 6 36.26	1.9016	6 30 37.0	8.963
13	23 8 30.33	1.9008	6 21 38.3	8.992
14	23 10 24.36	1.9002	6 12 38.0	9.019
15	23 12 18.35	1.8995	6 3 36.0	9.046
16	23 14 12.30	1.8988	5 54 32.4	9.072
17	23 16 6.21	1.8982	5 45 27.3	9.098
18	23 18 0.08	1.8976	5 36 20.6	9.124
19	23 19 53.92	1.8971	5 27 12.4	9.148
20	23 21 47.73	1.8965	5 18 2.8	9.172
21	23 23 41.50	1.8960	5 8 51.7	9.196
22	23 25 35.25	1.8956	4 59 39.2	9.219
23	23 27 28.97	1.8952	4 50 25.4	9.242
24	23 29 22.67	1.8947	S. 4 41 10.2	9.264

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 13.					**WEDNESDAY 15.**				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 29 22.67	1.8947	S. 4 41 10.2	9.264	0	1 0 32.44	1.9177	N. 2 57 8.6	9.596
1	23 31 16.34	1.8943	4 31 53.7	9.285	1	1 2 27.55	1.9191	3 6 44.1	9.587
2	23 33 9.99	1.8941	4 22 36.0	9.305	2	1 4 22.74	1.9205	3 16 19.0	9.578
3	23 35 3.63	1.8938	4 13 17.1	9.325	3	1 6 18.01	1.9219	3 25 53.4	9.568
4	23 36 57.25	1.8936	4 3 57.0	9.345	4	1 8 13.37	1.9235	3 35 27.2	9.558
5	23 38 50.86	1.8933	3 54 35.7	9.364	5	1 10 8.83	1.9251	3 45 0.3	9.547
6	23 40 44.45	1.8931	3 45 13.3	9.382	6	1 12 4.38	1.9267	3 54 32.8	9.536
7	23 42 38.03	1.8929	3 35 49.8	9.400	7	1 14 0.03	1.9283	4 4 4.6	9.523
8	23 44 31.60	1.8928	3 26 25.3	9.417	8	1 15 55.78	1.9299	4 13 35.5	9.509
9	23 46 25.17	1.8928	3 16 59.8	9.433	9	1 17 51.62	1.9316	4 23 5.6	9.496
10	23 48 18.74	1.8927	3 7 33.3	9.449	10	1 19 47.57	1.9333	4 32 34.9	9.481
11	23 50 12.30	1.8927	2 58 5.9	9.464	11	1 21 43.62	1.9351	4 42 3.3	9.466
12	23 52 5.86	1.8927	2 48 37.6	9.479	12	1 23 39.78	1.9369	4 51 30.8	9.450
13	23 53 59.43	1.8928	2 39 8.4	9.493	13	1 25 36.05	1.9387	5 0 57.3	9.433
14	23 55 53.00	1.8928	2 29 38.4	9.507	14	1 27 32.43	1.9407	5 10 22.8	9.416
15	23 57 46.57	1.8929	2 20 7.6	9.520	15	1 29 28.93	1.9427	5 19 47.3	9.399
16	23 59 40.15	1.8932	2 10 36.0	9.532	16	1 31 25.55	1.9447	5 29 10.7	9.381
17	0 1 33.75	1.8934	2 1 3.8	9.543	17	1 33 22.29	1.9467	5 38 33.0	9.362
18	0 3 27.36	1.8936	1 51 30.9	9.554	18	1 35 19.15	1.9487	5 47 54.1	9.342
19	0 5 20.98	1.8938	1 41 57.3	9.565	19	1 37 16.13	1.9507	5 57 14.0	9.321
20	0 7 14.62	1.8942	1 32 23.1	9.574	20	1 39 13.24	1.9528	6 6 32.6	9.299
21	0 9 8.28	1.8945	1 22 48.4	9.583	21	1 41 10.47	1.9549	6 15 49.9	9.278
22	0 11 1.96	1.8948	1 13 13.1	9.592	22	1 43 7.83	1.9571	6 25 5.9	9.256
23	0 12 55.66	1.8952	S. 1 3 37.2	9.600	23	1 45 5.32	1.9593	N. 6 34 20.6	9.233
TUESDAY 14.					**THURSDAY 16.**				
0	0 14 49.39	1.8957	S. 0 54 1.0	9.607	0	1 47 2.94	1.9615	N. 6 43 33.9	9.209
1	0 16 43.14	1.8962	0 44 24.4	9.614	1	1 49 0.70	1.9639	6 52 45.7	9.184
2	0 18 36.93	1.8967	0 34 47.4	9.620	2	1 50 58.61	1.9663	7 1 56.0	9.158
3	0 20 30.75	1.8973	0 25 10.0	9.626	3	1 52 56.66	1.9687	7 11 4.7	9.132
4	0 22 24.61	1.8979	0 15 32.3	9.630	4	1 54 54.85	1.9711	7 20 11.8	9.105
5	0 24 18.50	1.8985	S. 0 5 54.4	9.634	5	1 56 53.19	1.9736	7 29 17.3	9.078
6	0 26 12.43	1.8992	N. 0 3 43.8	9.638	6	1 58 51.68	1.9761	7 38 21.2	9.051
7	0 28 6.40	1.8999	0 13 22.2	9.641	7	2 0 50.32	1.9786	7 47 23.4	9.022
8	0 30 0.42	1.9007	0 23 0.7	9.644	8	2 2 49.11	1.9811	7 56 23.8	8.992
9	0 31 54.48	1.9014	0 32 39.4	9.646	9	2 4 48.05	1.9837	8 5 22.4	8.962
10	0 33 48.59	1.9022	0 42 18.2	9.647	10	2 6 47.15	1.9863	8 14 19.2	8.931
11	0 35 42.75	1.9031	0 51 57.0	9.647	11	2 8 46.41	1.9890	8 23 14.1	8.899
12	0 37 36.96	1.9040	1 1 35.8	9.647	12	2 10 45.83	1.9917	8 32 7.0	8.866
13	0 39 31.23	1.9050	1 11 14.6	9.646	13	2 12 45.41	1.9944	8 40 58.0	8.833
14	0 41 25.56	1.9059	1 20 53.3	9.644	14	2 14 45.16	1.9972	8 49 47.0	8.800
15	0 43 19.94	1.9069	1 30 31.9	9.642	15	2 16 45.08	2.0001	8 58 34.0	8.766
16	0 45 14.39	1.9080	1 40 10.4	9.640	16	2 18 45.17	2.0029	9 7 18.9	8.730
17	0 47 8.90	1.9090	1 49 48.7	9.637	17	2 20 45.43	2.0058	9 16 1.6	8.693
18	0 49 3.47	1.9101	1 59 26.8	9.633	18	2 22 45.86	2 0087	9 24 42.1	8.657
19	0 50 58.11	1.9113	2 9 4.7	9.628	19	2 24 46.47	2.0117	9 33 20.4	8.619
20	0 52 52.83	1.9126	2 18 42.2	9.623	20	2 26 47.26	2.0146	9 41 56.4	8.581
21	0 54 47.62	1.9138	2 28 19.4	9.617	21	2 28 48.22	2.0175	9 50 30.1	8.542
22	0 56 42.48	1.9150	2 37 56.2	9.610	22	2 30 49.36	2.0206	9 59 1.5	8.503
23	0 58 37.42	1.9163	2 47 32.6	9.603	23	2 32 50.69	2.0237	10 7 30.5	8.463
24	1 0 32.44	1.9177	N. 2 57 8.6	9.596	24	2 34 52.21	2.0268	N. 10 15 57.0	8.422

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 17.					**SUNDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 34 52.21	2.0268	N.10 15 57.0	8.422	0	4 16 15.48	2.2056	N.15 58 12.8	5.538
1	2 36 53.91	2.0299	10 24 24.1	8.380	1	4 18 27.94	2.2097	16 3 42.7	5.459
2	2 38 55.80	2.0331	10 32 42.6	8.337	2	4 20 40.64	2.2138	16 9 7.9	5.380
3	2 40 57.89	2.0364	10 41 1.5	8.293	3	4 22 53.59	2.2178	16 14 28.3	5.299
4	2 43 0.17	2.0396	10 49 17.8	8.249	4	4 25 6.78	2.2219	16 19 43.8	5.217
5	2 45 2.64	2.0428	10 57 31.4	8.204	5	4 27 20.22	2.2261	16 24 54.3	5.134
6	2 47 5.31	2.0461	11 5 42.3	8.158	6	4 29 33.91	2.2302	16 29 59.8	5.050
7	2 49 8.18	2.0495	11 13 50.4	8.112	7	4 31 47.84	2.2343	16 35 0.3	4.966
8	2 51 11.25	2.0528	11 21 55.7	8.065	8	4 34 2.02	2.2384	16 39 55.7	4.882
9	2 53 14.52	2.0562	11 29 58.2	8.017	9	4 36 16.45	2.2425	16 44 46.1	4.797
10	2 55 18.00	2.0597	11 37 57.8	7.968	10	4 38 31.12	2.2465	16 49 31.3	4.710
11	2 57 21.68	2.0631	11 45 54.4	7.919	11	4 40 46.03	2.2506	16 54 11.3	4.622
12	2 59 25.57	2.0666	11 53 48.1	7.869	12	4 43 1.19	2.2547	16 58 46.0	4.534
13	3 1 29.67	2.0701	12 1 38.7	7.818	13	4 45 16.59	2.2587	17 3 15.4	4.446
14	3 3 33.98	2.0736	12 9 26.2	7.766	14	4 47 32.24	2.2628	17 7 39.5	4.357
15	3 5 38.50	2.0772	12 17 10.6	7.713	15	4 49 48.13	2.2668	17 11 58.2	4.266
16	3 7 43.24	2.0807	12 24 51.8	7.660	16	4 52 4.26	2.2708	17 16 11.4	4.174
17	3 9 48.19	2.0843	12 32 29.8	7.607	17	4 54 20.63	2.2749	17 20 19.1	4.083
18	3 11 53.36	2.0880	12 40 4.6	7.552	18	4 56 37.25	2.2790	17 24 21.4	3.991
19	3 13 58.75	2.0917	12 47 36.0	7.495	19	4 58 54.11	2.2830	17 28 18.1	3.897
20	3 16 4.36	2.0953	12 55 4.0	7.438	20	5 1 11.21	2.2869	17 32 9.1	3.803
21	3 18 10.19	2.0990	13 2 28.6	7.382	21	5 3 28.54	2.2908	17 35 54.5	3.709
22	3 20 16.24	2.1027	13 9 49.8	7.325	22	5 5 46.11	2.2948	17 39 34.2	3.613
23	3 22 22.51	2.1064	N.13 17 7.6	7.267	23	5 8 3.92	2.2987	N.17 43 8.1	3.517
	SATURDAY 18.					**MONDAY 20.**			
0	3 24 29.01	2.1102	N.13 24 21.8	7.207	0	5 10 21.96	2.3027	N.17 46 36.2	3.420
1	3 26 35.74	2.1141	13 31 32.4	7.146	1	5 12 40.24	2.3066	17 49 58.5	3.322
2	3 28 42.70	2.1178	13 38 39.3	7.084	2	5 14 58.75	2.3104	17 53 14.9	3.224
3	3 30 49.88	2.1216	13 45 42.5	7.022	3	5 17 17.49	2.3143	17 56 25.4	3.126
4	3 32 57.29	2.1255	13 52 41.9	6.959	4	5 19 36.47	2.3182	17 59 30.0	3.026
5	3 35 4.94	2.1294	13 59 37.6	6.896	5	5 21 55.67	2.3219	18 2 28.5	2.925
6	3 37 12.82	2.1333	14 6 29.5	6.832	6	5 24 15.10	2.3257	18 5 21.0	2.824
7	3 39 20.93	2.1372	14 13 17.5	6.767	7	5 26 34.76	2.3295	18 8 7.4	2.722
8	3 41 29.28	2.1412	14 20 1.5	6.700	8	5 28 54.64	2.3332	18 10 47.7	2.620
9	3 43 37.87	2.1451	14 26 41.5	6.633	9	5 31 14.75	2.3370	18 13 21.8	2.517
10	3 45 46.69	2.1490	14 33 17.5	6.566	10	5 33 35.08	2.3407	18 15 49.7	2.413
11	3 47 55.75	2.1530	14 39 49.5	6.499	11	5 35 55.63	2.3443	18 18 11.3	2.309
12	3 50 5.05	2.1570	14 46 17.4	6.430	12	5 38 16.39	2.3479	18 20 26.7	2.204
13	3 52 14.59	2.1610	14 52 41.1	6.360	13	5 40 37.37	2.3515	18 22 35.8	2.098
14	3 54 24.37	2.1649	14 59 0.6	6.289	14	5 42 58.57	2.3551	18 24 38.5	1.992
15	3 56 34.38	2.1689	15 5 15.8	6.217	15	5 45 19.98	2.3586	18 26 34.8	1.885
16	3 58 44.64	2.1730	15 11 26.7	6.145	16	5 47 41.60	2.3620	18 28 24.7	1.777
17	4 0 55.14	2.1771	15 17 33.2	6.072	17	5 50 3.42	2.3654	18 30 8.1	1.669
18	4 3 5.89	2.1812	15 23 35.3	5.998	18	5 52 25.45	2.3688	18 31 45.0	1.561
19	4 5 16.88	2.1852	15 29 33.0	5.923	19	5 54 47.68	2.3723	18 33 15.4	1.452
20	4 7 28.11	2.1892	15 35 26.1	5.848	20	5 57 10.12	2.3757	18 34 39.2	1.342
21	4 9 39.58	2.1933	15 41 14.7	5.772	21	5 59 32.76	2.3790	18 35 56.4	1.232
22	4 11 51.30	2.1974	15 46 58.7	5.695	22	6 1 55.60	2.3822	18 37 7.0	1.121
23	4 14 3.27	2.2015	15 52 38.1	5.617	23	6 4 18.63	2.3854	18 38 10.9	1.010
24	4 16 15.48	2.2056	N.15 58 12.8	5.538	24	6 6 41.85	2.3886	N.18 39 8.2	0.898

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 6 41.85	2.3886	N.18 39 8.2	0.898
1	6 9 5.26	2.3917	18 39 58.7	0.785
2	6 11 28.86	2.3948	18 40 42.4	0.673
3	6 13 52.64	2.3978	18 41 19.4	0.560
4	6 16 16.60	2.4008	18 41 49.6	0.446
5	6 18 40.74	2.4038	18 42 12.9	0.331
6	6 21 5.06	2.4067	18 42 29.3	0.216
7	6 23 29.55	2.4096	18 42 38.8	+ 0.101
8	6 25 54.21	2.4124	18 42 41.4	− 0.014
9	6 28 19.04	2.4152	18 42 37.1	0.130
10	6 30 44.03	2.4179	18 42 25.8	0.247
11	6 33 9.19	2.4206	18 42 7.5	0.364
12	6 35 34.51	2.4233	18 41 42.1	0.481
13	6 37 59.99	2.4258	18 41 9.7	0.598
14	6 40 25.61	2.4282	18 40 30.3	0.716
15	6 42 51.38	2.4307	18 39 43.8	0.834
16	6 45 17.29	2.4331	18 38 50.2	0.952
17	6 47 43.35	2.4355	18 37 49.5	1.071
18	6 50 9.55	2.4378	18 36 41.7	1.190
19	6 52 35.88	2.4400	18 35 26.7	1.310
20	6 55 2.35	2.4422	18 34 4.5	1.429
21	6 57 28.95	2.4443	18 32 35.2	1.548
22	6 59 55.67	2.4464	18 30 58.7	1.668
23	7 2 22.52	2.4485	N.18 29 15.0	1.788

WEDNESDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 4 49.49	2.4504	N.18 27 24.1	1.908
1	7 7 16.57	2.4523	18 25 26.0	2.029
2	7 9 43.77	2.4542	18 23 20.6	2.150
3	7 12 11.08	2.4560	18 21 8.0	2.270
4	7 14 38.49	2.4578	18 18 48.2	2.391
5	7 17 6.01	2.4595	18 16 21.1	2.512
6	7 19 33.63	2.4611	18 13 46.8	2.632
7	7 22 1.34	2.4626	18 11 5.2	2.753
8	7 24 29.14	2.4641	18 8 16.4	2.874
9	7 26 57.03	2.4656	18 5 20.3	2.995
10	7 29 25.01	2.4670	18 2 17.0	3.116
11	7 31 53.07	2.4683	17 59 6.4	3.237
12	7 34 21.20	2.4695	17 55 48.6	3.357
13	7 36 49.41	2.4707	17 52 23.5	3.478
14	7 39 17.69	2.4719	17 48 51.2	3.599
15	7 41 46.04	2.4730	17 45 11.6	3.720
16	7 44 14.45	2.4740	17 41 24.8	3.840
17	7 46 42.92	2.4750	17 37 30.8	3.960
18	7 49 11.45	2.4759	17 33 29.6	4.080
19	7 51 40.03	2.4767	17 29 21.2	4.200
20	7 54 8.66	2.4776	17 25 5.6	4.320
21	7 56 37.34	2.4784	17 20 42.8	4.440
22	7 59 6.07	2.4791	17 16 12.8	4.559
23	8 1 34.83	2.4797	17 11 35.7	4.677
24	8 4 3.63	2.4803	N.17 6 51.5	4.796

THURSDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 4 3.63	2.4803	N.17 6 51.5	4.796
1	8 6 32.46	2.4808	17 2 0.2	4.914
2	8 9 1.32	2.4813	16 57 1.8	5.032
3	8 11 30.21	2.4817	16 51 56.3	5.150
4	8 13 59.12	2.4820	16 46 43.8	5.267
5	8 16 28.05	2.4822	16 41 24.2	5.385
6	8 18 56.99	2.4825	16 35 57.6	5.502
7	8 21 25.95	2.4827	16 30 24.0	5.618
8	8 23 54.92	2.4828	16 24 43.5	5.733
9	8 26 23.89	2.4829	16 18 56.1	5.848
10	8 28 52.87	2.4830	16 13 1.8	5.963
11	8 31 21.85	2.4830	16 7 0.6	6.077
12	8 33 50.83	2.4829	16 0 52.6	6.190
13	8 36 19.80	2.4828	15 54 37.8	6.303
14	8 38 48.77	2.4827	15 48 16.2	6.416
15	8 41 17.72	2.4824	15 41 47.9	6.527
16	8 43 46.65	2.4821	15 35 12.9	6.638
17	8 46 15.57	2.4818	15 28 31.3	6.748
18	8 48 44.47	2.4815	15 21 43.1	6.858
19	8 51 13.35	2.4811	15 14 48.3	6.968
20	8 53 42.20	2.4806	15 7 46.9	7.077
21	8 56 11.02	2.4801	15 0 39.0	7.185
22	8 58 39.81	2.4796	14 53 24.7	7.292
23	9 1 8.57	2.4790	N.14 46 4.0	7.397

FRIDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 3 37.29	2.4783	N.14 38 37.0	7.502
1	9 6 5.97	2.4777	14 31 3.7	7.607
2	9 8 34.61	2.4770	14 23 24.1	7.712
3	9 11 3.21	2.4762	14 15 38.2	7.816
4	9 13 31.76	2.4754	14 7 46.2	7.917
5	9 16 0.26	2.4747	13 59 48.2	8.018
6	9 18 28.72	2.4739	13 51 44.1	8.118
7	9 20 57.13	2.4730	13 43 34.0	8.217
8	9 23 25.48	2.4720	13 35 18.0	8.316
9	9 25 53.77	2.4710	13 26 56.1	8.413
10	9 28 22.00	2.4700	13 18 28.4	8.510
11	9 30 50.17	2.4690	13 9 54.9	8.607
12	9 33 18.28	2.4680	13 1 15.6	8.701
13	9 35 46.33	2.4669	12 52 30.7	8.794
14	9 38 14.31	2.4658	12 43 40.3	8.887
15	9 40 42.22	2.4647	12 34 44.3	8.979
16	9 43 10.07	2.4635	12 25 42.8	9.069
17	9 45 37.84	2.4623	12 16 36.0	9.158
18	9 48 5.54	2.4611	12 7 23.9	9.246
19	9 50 33.17	2.4598	11 58 6.5	9.333
20	9 53 0.72	2.4585	11 48 43.9	9.419
21	9 55 28.19	2.4572	11 39 16.2	9.504
22	9 57 55.58	2.4559	11 29 43.4	9.587
23	10 0 22.90	2.4546	11 20 5.7	9.669
24	10 2 50.14	2.4533	N.11 10 23.1	9.751

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 25.					MONDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 2 50.14	2.4533	N. 11 10 23.1	9.751	0	11 58 52.74	2.3822	N. 2 14 29.2	12.018
1	10 5 17.30	2.4519	11 0 35.6	9.832	1	12 1 15.63	2.3809	2 2 27.8	12.028
2	10 7 44.37	2.4505	10 50 43.3	9.910	2	12 3 38.44	2.3796	1 50 25.8	12.037
3	10 10 11.36	2.4492	10 40 46.4	9.987	3	12 6 1.18	2.3783	1 38 23.3	12.045
4	10 12 38.27	2.4478	10 30 44.9	10.063	4	12 8 23.84	2.3770	1 26 20.4	12.051
5	10 15 5.09	2.4463	10 20 38.8	10.139	5	12 10 46.42	2.3757	1 14 17.2	12.055
6	10 17 31.82	2.4448	10 10 28.2	10.212	6	12 13 8.92	2.3744	1 2 13.8	12.057
7	10 19 58.46	2.4433	10 0 13.3	10.284	7	12 15 31.35	2.3732	0 50 10.3	12.059
8	10 22 25.02	2.4419	9 49 54.1	10.356	8	12 17 53.70	2.3719	0 38 6.7	12.059
9	10 24 51.49	2.4404	9 39 30.6	10.426	9	12 20 15.98	2.3707	0 26 3.2	12.057
10	10 27 17.87	2.4389	9 29 3.0	10.494	10	12 22 38.19	2.3696	0 13 59.8	12.054
11	10 29 44.16	2.4374	9 18 31.3	10.561	11	12 25 0.33	2.3684	N. 0 1 56.7	12.049
12	10 32 10.36	2.4359	9 7 55.7	10.626	12	12 27 22.39	2.3672	S. 0 10 6.1	12.043
13	10 34 36.47	2.4344	8 57 16.2	10.691	13	12 29 44.39	2.3661	0 22 8.5	12.036
14	10 37 2.49	2.4329	8 46 32.8	10.754	14	12 32 6.32	2.3649	0 34 10.4	12.026
15	10 39 28.42	2.4313	8 35 45.7	10.816	15	12 34 28.18	2.3638	0 46 11.6	12.014
16	10 41 54.25	2.4297	8 24 54.9	10.876	16	12 36 49.97	2.3627	0 58 12.1	12.002
17	10 44 19.99	2.4283	8 14 0.6	10.934	17	12 39 11.70	2.3616	1 10 11.9	11.990
18	10 46 45.64	2.4267	8 3 2.8	10.992	18	12 41 33.36	2.3605	1 22 10.9	11.975
19	10 49 11.20	2.4252	7 52 1.6	11.048	19	12 43 54.96	2.3594	1 34 8.9	11.957
20	10 51 36.66	2.4236	7 40 57.1	11.102	20	12 46 16.49	2.3583	1 46 5.8	11.939
21	10 54 2.03	2.4221	7 29 49.4	11.154	21	12 48 37.96	2.3573	1 58 1.6	11.920
22	10 56 27.31	2.4206	7 18 38.6	11.206	22	12 50 59.37	2.3563	2 9 56.2	11.899
23	10 58 52.50	2.4190	N. 7 7 24.7	11.257	23	12 53 20.72	2.3554	S. 2 21 49.5	11.877
	SUNDAY 26.					TUESDAY 28			
0	11 1 17.59	2.4174	N. 6 56 7.8	11.306	0	12 55 42.02	2.3545	S. 2 33 41.5	11.854
1	11 3 42.59	2.4159	6 44 48.0	11.353	1	12 58 3.26	2.3535	2 45 32.0	11.828
2	11 6 7.50	2.4143	6 33 25.5	11.398	2	13 0 24.44	2.3525	2 57 20.9	11.801
3	11 8 32.31	2.4127	6 22 0.3	11.442	3	13 2 45.56	2.3516	3 9 8.1	11.772
4	11 10 57.03	2.4112	6 10 32.5	11.484	4	13 5 6.63	2.3507	3 20 53.6	11.743
5	11 13 21.66	2.4097	5 59 2.2	11.526	5	13 7 27.64	2.3497	3 32 37.3	11.713
6	11 15 46.20	2.4082	5 47 29.4	11.566	6	13 9 48.59	2.3488	3 44 19.2	11.682
7	11 18 10.65	2.4067	5 35 54.3	11.603	7	13 12 9.49	2.3479	3 55 59.2	11.648
8	11 20 35.01	2.4052	5 24 17.0	11.640	8	13 14 30.34	2.3471	4 7 37.0	11.612
9	11 22 59.27	2.4036	5 12 37.5	11.676	9	13 16 51.14	2.3462	4 19 12.6	11.575
10	11 25 23.44	2.4022	5 0 55.9	11.709	10	13 19 11.89	2.3454	4 30 46.0	11.538
11	11 27 47.53	2.4007	4 49 12.4	11.741	11	13 21 32.59	2.3447	4 42 17.2	11.500
12	11 30 11.53	2.3992	4 37 27.0	11.772	12	13 23 53.25	2.3439	4 53 46.0	11.460
13	11 32 35.44	2.3977	4 25 39.8	11.801	13	13 26 13.86	2.3431	5 5 12.4	11.418
14	11 34 59.26	2.3962	4 13 50.9	11.828	14	13 28 34.42	2.3423	5 16 36.2	11.375
15	11 37 22.99	2.3947	4 2 0.4	11.854	15	13 30 54.93	2.3415	5 27 57.4	11.332
16	11 39 46.63	2.3933	3 50 8.4	11.878	16	13 33 15.40	2.3407	5 39 16.0	11.287
17	11 42 10.19	2.3919	3 38 15.0	11.901	17	13 35 35.82	2.3399	5 50 31.8	11.240
18	11 44 33.66	2.3905	3 26 20.3	11.922	18	13 37 56.19	2.3392	6 1 44.8	11.193
19	11 46 57.05	2.3891	3 14 24.3	11.942	19	13 40 16.52	2.3385	6 12 55.0	11.144
20	11 49 20.35	2.3877	3 2 27.2	11.961	20	13 42 36.81	2.3378	6 24 2.1	11.093
21	11 51 43.57	2.3863	2 50 29.0	11.977	21	13 44 57.06	2.3372	6 35 6.1	11.041
22	11 54 6.71	2.3850	2 38 29.9	11.992	22	13 47 17.27	2.3365	6 46 7.0	10.989
23	11 56 29.77	2.3836	2 26 29.9	12.006	23	13 49 37.44	2.3358	6 57 4.8	10.936
24	11 58 52.74	2.3822	N. 2 14 29.2	12.018	24	13 51 57.56	2.3350	S. 7 7 59.3	10.881

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 51 57.56	2.3350	S. 7 7 59.3	10.881
1	13 54 17.64	2.3344	7 18 50.5	10.825
2	13 56 37.69	2.3338	7 29 38.3	10.767
3	13 58 57.70	2.3332	7 40 22.6	10.708
4	14 1 17.67	2.3325	7 51 3.3	10.649
5	14 3 37.60	2.3318	8 1 40.5	10.590
6	14 5 57.49	2.3312	8 12 14.1	10.529
7	14 8 17.35	2.3306	8 22 44.0	10.466
8	14 10 37.17	2.3300	8 33 10.0	10.401
9	14 12 56.95	2.3294	8 43 32.1	10.336
10	14 15 16.70	2.3288	8 53 50.3	10.271
11	14 17 36.41	2.3282	9 4 4.6	10.204
12	14 19 56.08	2.3276	9 14 14.8	10.136
13	14 22 15.72	2.3270	9 24 20.9	10.067
14	14 24 35.32	2.3264	9 34 22.9	9.998
15	14 26 54.89	2.3258	9 44 20.7	9.927
16	14 29 14.42	2.3252	9 54 14.2	9.855
17	14 31 33.92	2.3247	10 4 3.3	9.782
18	14 33 53.38	2.3241	10 13 48.1	9.709
19	14 36 12.81	2.3235	10 23 28.4	9.635
20	14 38 32.20	2.3229	10 33 4.2	9.560
21	14 40 51.56	2.3223	10 42 35.6	9.485
22	14 43 10.88	2.3218	10 52 2.4	9.407
23	14 45 30.17	2.3213	S. 11 1 24.5	9.329

THURSDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 47 49.43	2.3207	S. 11 10 41.9	9.251
1	14 50 8.65	2.3200	11 19 54.6	9.172
2	14 52 27.83	2.3194	11 29 2.5	9.091
3	14 54 46.98	2.3188	11 38 5.5	9.009
4	14 57 6.09	2.3182	11 47 3.6	8.928
5	14 59 25.16	2.3176	11 55 56.8	8.846
6	15 1 44.20	2.3170	12 4 45.1	8.763
7	15 4 3.20	2.3163	12 13 28.4	8.679
8	15 6 22.16	2.3157	12 22 6.6	8.594
9	15 8 41.09	2.3151	12 30 39.6	8.508
10	15 10 59.98	2.3145	12 39 7.5	8.422
11	15 13 18.83	2.3138	12 47 30.2	8.336
12	15 15 37.64	2.3132	12 55 47.8	8.249
13	15 17 56.41	2.3125	13 4 0.1	8.161
14	15 20 15.14	2.3119	13 12 7.1	8.072
15	15 22 33.84	2.3112	13 20 8.7	7.982
16	15 24 52.49	2.3105	13 28 5.0	7.893
17	15 27 11.10	2.3097	13 35 55.9	7.803
18	15 29 29.66	2.3090	13 43 41.4	7.712
19	15 31 48.18	2.3083	13 51 21.4	7.621
20	15 34 6.66	2.3076	13 58 55.9	7.529
21	15 36 25.09	2.3068	14 6 24.9	7.437
22	15 38 43.48	2.3061	14 13 48.3	7.344
23	15 41 1.82	2.3053	14 21 6.1	7.250
24	15 43 20.11	2.3045	S. 14 28 18.3	7.156

FRIDAY, OCTOBER 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 43 20.11	2.3045	S. 14 28 18.3	7.156

PHASES OF THE MOON.

		d	h	m
☽ First Quarter	Sept.	4	19	55.5
○ Full Moon	. . . .	12	22	50.3
☾ Last Quarter	. . . .	20	17	55.8
● New Moon	. . . .	27	9	18.6

		d	h
☾ Apogee	Sept.	11	3.4
☾ Perigee		26	7.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}.	P. L. of Diff.	VI^{h}.	P. L. of Diff.	IX^{h}.	P. L. of Diff.
1	**Sun**	W.	41° 30′ 31″	2498	43° 11′ 47″	2515	44° 52′ 39″	2533	46° 33′ 6″	2552
	Antares	E.	48 30 59	2318	46 45 26	2342	45 0 27	2366	43 16 4	2393
	α Aquilæ	E.	96 47 11	2669	95 9 49	2682	93 32 45	2697	91 56 1	2713
2	**Sun**	W.	54 48 52	2647	56 26 43	2667	58 4 7	2687	59 41 5	2707
	Jupiter	W.	26 19 4	2408	28 2 27	2426	29 45 25	2444	31 27 57	2462
	Antares	E.	34 44 22	2553	33 4 22	2591	31 25 15	2635	29 47 7	2682
	α Aquilæ	E.	83 58 12	2610	82 23 57	2631	80 50 10	2655	79 16 53	2678
3	**Sun**	W.	67 39 18	2806	69 13 38	2825	70 47 33	2845	72 21 2	2865
	Jupiter	W.	39 54 14	2553	41 34 13	2578	43 13 46	2601	44 52 54	2609
	Spica	W.	27 5 44	2588	28 44 56	2596	30 23 57	2605	32 2 45	2615
	α Aquilæ	E.	71 38 28	3013	70 8 31	3042	68 39 10	3073	67 10 27	3105
4	**Sun**	W.	80 2 17	2960	81 33 20	2978	83 4 0	2997	84 34 17	3014
	Jupiter	W.	53 2 26	2698	54 39 9	2715	56 15 29	2732	57 51 27	2749
	Spica	W.	40 12 49	2679	41 49 57	2693	43 26 46	2707	45 3 17	2721
	Mars	W.	23 54 29	2959	25 25 33	2965	26 56 29	2973	28 27 15	2983
	α Aquilæ	E.	59 57 1	3284	58 32 31	3324	57 8 47	3366	55 45 52	3411
	Fomalhaut	E.	92 17 52	2940	90 46 24	2958	89 15 18	2974	87 44 33	2991
5	**Sun**	W.	92 0 19	3099	93 28 30	3115	94 56 21	3130	96 23 54	3146
	Jupiter	W.	65 45 52	2828	67 19 44	2843	68 53 16	2857	70 26 30	2872
	Spica	W.	53 1 14	2790	54 35 55	2803	56 10 19	2816	57 44 26	2829
	Mars	W.	35 57 47	3040	37 27 10	3052	38 56 18	3065	40 25 11	3077
	α Aquilæ	E.	49 4 39	3672	47 47 22	3734	46 31 11	3801	45 16 10	3872
	Fomalhaut	E.	80 16 12	3079	78 47 37	3098	77 19 25	3117	75 51 36	3136
	α Pegasi	E.	94 53 55	3047	93 24 40	3060	91 55 41	3073	90 26 59	3087
6	**Sun**	W.	103 37 12	3216	105 3 2	3230	106 28 36	3242	107 53 56	3254
	Jupiter	W.	78 8 13	2938	79 39 44	2950	81 11 0	2962	82 42 1	2973
	Spica	W.	65 30 54	2891	67 3 25	2901	68 35 42	2912	70 7 45	2923
	Mars	W.	47 45 53	3137	49 13 18	3148	50 40 30	3159	52 7 28	3169
	Antares	W.	21 29 9	3364	22 52 7	3316	24 16 0	3277	25 40 38	3247
	Fomalhaut	E.	68 38 13	3232	67 12 42	3253	65 47 35	3274	64 22 53	3295
	α Pegasi	E:	83 7 46	3158	81 40 47	3173	80 14 5	3187	78 47 40	3201
7	**Sun**	W.	114 57 11	3308	116 21 13	3318	117 45 4	3327	119 8 44	3337
	Jupiter	W.	90 13 44	3024	91 43 27	3033	93 12 59	3042	94 42 20	3050
	Spica	W.	77 44 48	2972	79 15 36	2980	80 46 14	2988	82 16 42	2996
	Mars	W.	59 19 16	3219	60 45 3	3227	62 10 40	3236	63 36 7	3244
	Antaros	W.	32 50 39	3167	34 17 28	3159	35 44 26	3153	37 11 31	3149
	Fomalhaut	E.	57 25 45	3410	56 3 40	3437	54 42 5	3463	53 21 0	3491
	α Pegasi	E.	71 39 51	3275	70 15 10	3289	68 50 46	3305	67 26 40	3320
8	**Jupiter**	W.	102 6 43	3086	103 35 10	3092	105 3 29	3098	106 31 41	3104
	Spica	W.	89 46 39	3030	91 16 14	3037	92 45 41	3043	94 15 1	3048
	Mars	W.	70 41 4	3279	72 5 40	3286	73 30 8	3292	74 54 29	3297
	Antares	W.	44 27 55	3138	45 55 18	3138	47 22 41	3138	48 50 4	3138
	Fomalhaut	E.	46 43 57	3659	45 26 26	3699	44 9 38	3743	42 53 36	3790
	α Pegasi	E.	60 30 49	3404	59 8 37	3423	57 46 47	3443	56 25 19	3463
	α Arietis	E.	103 15 49	3156	101 48 47	3161	100 21 51	3165	98 55 0	3169

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	**Sun**	W.	48° 13′ 7″	2570	49° 52′ 43″	2590	51° 31′ 52″	2609	53° 10′ 35″	2628
	Antares	E.	41 32 19	2481	39 49 14	2450	38 6 51	2482	36 25 13	2516
	α Aquilæ	E.	90 19 39	2731	88 43 40	2749	87 8 5	2768	85 32 55	2788
2	**Sun**	W.	61 17 36	2728	62 53 41	2747	64 29 19	2766	66 4 32	2786
	Jupiter	W.	33 10 4	2480	34 51 45	2499	36 33 0	2517	38 13 50	2535
	Antares	E.	28 10 3	2735	26 34 10	2795	24 59 35	2863	23 26 29	2943
	α Aquilæ	E.	77 44 6	2903	76 11 51	2929	74 40 9	2956	73 9 1	2984
3	**Sun**	W.	73 54 6	2884	75 26 45	2903	76 59 0	2923	78 30 50	2941
	Jupiter	W.	46 31 37	2626	48 9 56	2645	49 47 50	2663	51 25 20	2681
	Spica	W.	33 41 19	2621	35 19 37	2639	36 57 39	2658	38 35 23	2676
	α Aquilæ	E.	65 42 23	3138	64 14 59	3173	62 48 17	3208	61 22 17	3245
4	**Sun**	W.	86 4 12	3032	87 33 45	3049	89 2 57	3066	90 31 48	3082
	Jupiter	W.	59 27 2	2766	61 2 15	2781	62 37 8	2797	64 11 40	2812
	Spica	W.	46 39 29	2735	48 15 23	2749	49 50 58	2763	51 26 15	2776
	Mars	W.	29 57 49	2993	31 28 10	3005	32 58 17	3017	34 28 9	3028
	α Aquilæ	E.	54 23 48	3457	53 2 36	3506	51 42 19	3558	50 22 59	3613
	Fomalhaut	E.	86 14 9	3009	84 44 7	3026	83 14 27	3044	81 45 9	3061
5	**Sun**	W.	97 51 8	3160	99 18 5	3175	100 44 44	3189	102 11 6	3203
	Jupiter	W.	71 59 25	2885	73 32 3	2899	75 4 23	2912	76 36 26	2925
	Spica	W.	59 18 16	2842	60 51 49	2855	62 25 6	2868	63 58 8	2879
	Mars	W.	41 53 49	3089	43 22 12	3101	44 50 20	3113	46 18 14	3125
	α Aquilæ	E.	44 2 22	3949	42 49 52	4033	41 38 45	4124	40 29 6	4222
	Fomalhaut	E.	74 24 10	3154	72 57 6	3173	71 30 25	3193	70 4 7	3213
	α Pegasi	E.	88 58 34	3102	87 30 27	3116	86 2 37	3129	84 35 3	3143
6	**Sun**	W.	109 19 1	3265	110 43 53	3277	112 8 31	3288	113 32 57	3298
	Jupiter	W.	84 12 48	2984	85 43 21	2994	87 13 41	3004	88 43 49	3014
	Spica	W.	71 39 35	2933	73 11 12	2943	74 42 36	2953	76 13 48	2962
	Mars	W.	53 34 14	3180	55 0 47	3190	56 27 8	3199	57 53 18	3209
	Antares	W.	27 5 52	3223	28 31 34	3204	29 57 39	3188	31 24 2	3177
	Fomalhaut	E.	62 58 36	3317	61 34 44	3339	60 11 18	3362	58 48 18	3386
	α Pegasi	E.	77 21 32	3215	75 55 41	3230	74 30 7	3244	73 4 50	3259
7	**Sun**	W.	120 32 13	3345	121 55 33	3353	123 18 43	3361	124 41 44	3368
	Jupiter	W.	96 11 31	3057	97 40 33	3065	99 9 25	3073	100 38 8	3079
	Spica	W.	83 47 0	3004	85 17 8	3011	86 47 7	3018	88 16 57	3025
	Mars	W.	65 1 24	3252	66 26 32	3259	67 51 31	3267	69 16 21	3273
	Antares	W.	38 38 41	3146	40 5 55	3143	41 33 13	3141	43 0 33	3139
	Fomalhaut	E.	52 0 26	3521	50 40 25	3553	49 20 59	3586	48 2 9	3621
	α Pegasi	E.	66 2 52	3337	64 39 23	3353	63 16 13	3369	61 53 21	3386
8	**Jupiter**	W.	107 59 46	3109	109 27 45	3113	110 55 39	3118	112 23 27	3121
	Spica	W.	95 44 14	3053	97 13 21	3058	98 42 22	3062	100 11 18	3067
	Mars	W.	76 18 44	3302	77 42 53	3307	79 6 56	3312	80 30 54	3316
	Antares	W.	50 17 27	3138	51 44 50	3139	53 12 12	3139	54 39 34	3139
	Fomalhaut	E.	41 38 23	3842	40 24 4	3897	39 10 41	3958	37 58 20	4027
	α Pegasi	E.	55 4 13	3484	53 43 31	3506	52 23 14	3530	51 3 23	3555
	α Arietis	E.	97 28 14	3173	96 1 33	3177	94 34 56	3180	93 8 23	3184

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
9	Spica	W.	101° 40′ 8″	3071	103° 8′ 53″	3074	104° 37′ 34″	3077	106° 6′ 12″	3080
	Mars	W.	81 54 47	3319	83 18 36	3324	84 42 20	3326	86 6 1	3330
	Antares	W.	56 6 56	3140	57 34 17	3140	59 1 38	3140	60 28 59	3141
	Fomalhaut	E.	36 47 7	4103	35 37 8	4185	34 28 28	4279	33 21 16	4384
	α Pegasi	E.	49 44 0	3582	48 25 6	3610	47 6 43	3641	45 48 53	3674
	α Arietis	E.	91 41 55	3188	90 15 31	3191	88 49 11	3193	87 22 54	3197
10	Mars	W.	93 3 39	3341	94 27 3	3342	95 50 26	3344	97 13 47	3345
	Antares	W.	67 45 38	3141	69 12 58	3140	70 40 19	3140	72 7 40	3140
	α Aquilæ	W.	31 4 43	5730	31 52 50	5507	32 43 29	5311	33 36 28	5137
	α Arietis	E.	80 12 25	3211	78 46 29	3214	77 20 37	3217	75 54 48	3219
	Aldebaran	E.	112 36 7	3066	111 7 16	3068	109 38 27	3069	108 9 39	3069
11	Antares	W.	79 24 36	3135	80 52 3	3134	82 19 31	3133	83 47 1	3132
	α Aquilæ	W.	38 30 39	4512	39 34 20	4424	40 39 20	4342	41 45 34	4269
	α Arietis	E.	68 46 27	3233	67 20 57	3236	65 55 30	3239	64 30 7	3242
	Aldebaran	E.	100 45 45	3069	99 16 57	3069	97 48 9	3068	96 19 20	3066
12	Antares	W.	91 4 57	3123	92 32 39	3121	94 0 23	3119	95 28 10	3117
	α Aquilæ	W.	47 32 6	3985	48 44 0	3942	49 56 37	3902	51 9 55	3865
	α Arietis	E.	57 24 12	3962	55 59 16	3967	54 34 26	3972	53 9 42	3979
	Aldebaran	E.	88 54 50	3059	87 25 50	3056	85 56 47	3054	84 27 41	3052
13	α Aquilæ	W.	57 25 6	3714	58 41 38	3690	59 58 36	3666	61 15 59	3645
	α Arietis	E.	46 8 12	3322	44 44 26	3334	43 20 54	3348	41 57 38	3363
	Aldebaran	E.	77 1 25	3038	75 31 59	3034	74 2 28	3030	72 32 53	3027
14	α Aquilæ	W.	67 48 17	3555	69 7 41	3538	70 27 23	3524	71 47 21	3510
	Fomalhaut	W.	35 23 4	4076	36 33 29	3998	37 45 11	3927	38 58 3	3864
	α Pegasi	W.	24 18 27	5716	25 6 43	5409	25 58 31	5149	26 53 31	4925
	Aldebaran	E.	65 3 47	3006	63 33 42	3002	62 3 32	2997	60 33 16	2993
	Saturn	E.	107 13 15	3046	105 43 59	3041	104 14 37	3036	102 45 9	3031
15	α Aquilæ	W.	78 30 45	3450	79 52 5	3440	81 13 36	3431	82 35 18	3421
	Fomalhaut	W.	45 16 58	3619	46 35 12	3581	47 54 7	3546	49 13 40	3515
	α Pegasi	W.	32 7 4	4176	33 15 53	4075	34 26 19	3984	35 38 14	3905
	Aldebaran	E.	53 0 21	2966	51 29 26	2960	49 58 23	2954	48 27 13	2949
	Saturn	E.	95 16 12	3004	93 46 4	2998	92 15 49	2992	90 45 26	2985
	Pollux	E.	96 53 38	3039	95 24 14	3033	93 54 42	3027	92 25 3	3021
16	Fomalhaut	W.	55 59 44	3379	57 22 25	3356	58 45 32	3334	60 9 4	3313
	α Pegasi	W.	41 55 47	3605	43 14 16	3559	44 33 35	3517	45 53 40	3479
	Aldebaran	E.	40 49 25	2916	39 17 26	2909	37 45 18	2901	36 13 0	2893
	Saturn	E.	83 11 31	2952	81 40 18	2946	80 8 57	2938	78 37 26	2931
	Pollux	E.	84 54 47	2989	83 24 20	2981	81 53 44	2975	80 23 0	2968
17	Fomalhaut	W.	67 12 30	3221	68 38 14	3204	70 4 18	3188	71 30 41	3173
	α Pegasi	W.	52 44 4	3319	54 7 54	3292	55 32 15	3266	56 57 6	3242
	Saturn	E.	70 57 23	2890	69 24 51	2880	67 52 7	2872	66 19 12	2863
	Pollux	E.	72 47 7	2933	71 15 30	2925	69 43 43	2918	68 11 47	2910
	Regulus	E.	108 36 14	2854	107 2 56	2845	105 29 26	2836	103 55 45	2827
	Sun	E.	134 41 13	3209	133 15 14	3198	131 49 3	3189	130 22 41	3179

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
9	Spica	W.	107° 34′ 46″	3083	109° 3′ 16″	3087	110° 31′ 42″	3089	112° 0′ 5″	3091
	MARS	W.	87 29 38	3332	88 53 12	3334	90 16 44	3337	91 40 13	3339
	Antares	W.	61 56 19	3141	63 23 39	3141	64 50 59	3142	66 18 18	3141
	Fomalhaut	E.	32 15 40	4502	31 11 50	4636	30 9 56	4787	29 10 9	4961
	α Pegasi	E.	44 31 38	3710	43 15 2	3749	41 59 7	3792	40 43 57	3839
	α Arietis	E.	85 56 41	3900	84 30 32	3903	83 4 26	3906	81 38 24	3909
10	MARS	W.	98 37 7	3345	100 0 27	3345	101 23 46	3346	102 47 4	3346
	Antares	W.	73 35 1	3139	75 2 23	3138	76 29 46	3138	77 57 10	3136
	α Aquilæ	W.	34 31 37	4984	35 28 45	4845	36 27 44	4722	37 28 25	4612
	α Arietis	E.	74 29 1	3921	73 3 17	3925	71 37 37	3927	70 12 0	3931
	Aldebaran	E.	106 40 51	3069	105 12 4	3070	103 43 18	3070	102 14 32	3069
11	Antares	W.	85 14 32	3130	86 42 5	3129	88 9 40	3127	89 37 17	3124
	α Aquilæ	W.	42 52 55	4202	44 1 19	4140	45 10 42	4084	46 20 59	4033
	α Arietis	E.	63 4 47	3945	61 39 31	3949	60 14 20	3953	58 49 13	3958
	Aldebaran	E.	94 50 29	3065	93 21 37	3064	91 52 43	3062	90 23 47	3061
12	Antares	W.	96 55 59	3114	98 23 51	3113	99 51 45	3110	101 19 42	3108
	α Aquilæ	W.	52 23 50	3830	53 38 21	3797	54 53 26	3768	56 9 2	3741
	α Arietis	E.	51 45 6	3286	50 20 38	3294	48 56 19	3302	47 32 10	3312
	Aldebaran	E.	82 58 33	3049	81 29 21	3047	80 0 6	3043	78 30 47	3041
13	α Aquilæ	W.	62 33 45	3624	63 51 53	3605	65 10 22	3587	66 29 10	3570
	α Arietis	E.	40 34 39	3380	39 12 0	3400	37 49 43	3423	36 27 52	3448
	Aldebaran	E.	71 3 14	3023	69 33 30	3019	68 3 41	3015	66 33 47	3010
14	α Aquilæ	W.	73 7 34	3497	74 28 1	3485	75 48 42	3472	77 9 37	3461
	Fomalhaut	W.	40 11 59	3806	41 26 55	3753	42 42 46	3705	43 59 28	3660
	α Pegasi	W.	27 51 26	4732	28 51 59	4564	29 54 55	4417	31 0 1	4289
	Aldebaran	E.	59 2 54	2988	57 32 26	2982	56 1 51	2977	54 31 9	2972
	SATURN	E.	101 15 35	3026	99 45 54	3021	98 16 7	3015	96 46 13	3009
15	α Aquilæ	W.	83 57 11	3412	85 19 14	3403	86 41 27	3396	88 3 48	3388
	Fomalhaut	W.	50 33 48	3484	51 54 30	3454	53 15 45	3428	54 37 30	3402
	α Pegasi	W.	36 51 29	3833	38 5 57	3768	39 21 33	3709	40 38 11	3654
	Aldebaran	E.	46 55 56	2942	45 24 31	2936	43 52 58	2929	42 21 16	2922
	SATURN	E.	89 14 55	2980	87 44 16	2973	86 13 30	2966	84 42 35	2959
	Pollux	E.	90 55 16	3014	89 25 21	3008	87 55 18	3001	86 25 7	2994
16	Fomalhaut	W.	61 33 1	3293	62 57 21	3274	64 22 3	3256	65 47 6	3238
	α Pegasi	W.	47 14 28	3442	48 35 57	3408	49 58 4	3377	51 20 47	3347
	Aldebaran	E.	34 40 32	2886	33 7 55	2878	31 35 8	2869	30 2 10	2861
	SATURN	E.	77 5 46	2923	75 33 56	2914	74 1 55	2906	72 29 44	2898
	Pollux	E.	78 52 7	2961	77 21 5	2954	75 49 54	2947	74 18 35	2940
17	Fomalhaut	W.	72 57 22	3158	74 24 21	3143	75 51 30	3129	77 19 14	3114
	α Pegasi	W.	58 22 25	3219	59 48 12	3197	61 14 25	3175	62 41 4	3155
	SATURN	E.	64 46 6	2854	63 12 48	2844	61 39 17	2835	60 5 34	2825
	Pollux	E.	66 39 41	2903	65 7 26	2896	63 35 2	2888	62 2 28	2881
	Regulus	E.	102 21 52	2818	100 47 47	2808	99 13 29	2798	97 38 58	2788
	SUN	E.	128 56 7	3169	127 29 21	3158	126 2 22	3148	124 35 11	3137

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
18	Fomalhaut	W.	78 47 7	3101	80 15 16	3087	81 43 42	3073	83 12 24	3060
	α Pegasi	W.	64 8 7	3135	65 35 34	3115	67 3 25	3096	68 31 40	3078
	α Arietis	W.	22 0 8	3967	23 12 20	3812	24 27 10	3680	25 44 18	3568
	SATURN	E.	58 31 38	2815	56 57 29	2804	55 23 6	2794	53 48 30	2783
	Pollux	E.	60 29 45	2873	58 56 52	2866	57 23 50	2859	55 50 39	2852
	Regulus	E.	96 4 14	2777	94 29 16	2767	92 54 5	2756	91 18 40	2745
	SUN	E.	123 7 46	3125	121 40 7	3114	120 12 15	3103	118 44 9	3091
19	Fomalhaut	W.	90 39 54	2998	92 10 9	2986	93 40 39	2975	95 11 23	2963
	α Pegasi	W.	75 58 21	2992	77 28 44	2975	78 59 28	2960	80 30 31	2944
	α Arietis	W.	32 36 7	3188	34 2 30	3135	35 29 57	3087	36 58 22	3043
	SATURN	E.	45 51 55	2727	44 15 51	2716	42 39 32	2704	41 2 57	2692
	Pollux	E.	48 2 32	2821	46 28 32	2816	44 54 25	2811	43 20 12	2806
	Regulus	E.	83 17 47	2687	81 40 49	2674	80 3 34	2661	78 26 2	2649
	SUN	E.	111 19 52	3027	109 50 13	3014	108 20 18	3001	106 50 6	2987
20	α Pegasi	W.	88 10 38	2870	89 43 35	2855	91 16 51	2842	92 50 25	2828
	α Arietis	W.	44 32 49	2866	46 5 51	2837	47 39 31	2809	49 13 47	2782
	SATURN	E.	32 56 8	2634	31 17 59	2622	29 39 34	2611	28 0 54	2601
	Pollux	E.	35 28 32	2812	33 54 20	2818	32 20 16	2828	30 46 24	2842
	Regulus	E.	70 13 58	2582	68 34 38	2568	66 54 59	2553	65 15 0	2539
	SUN	E.	99 14 41	2915	97 42 41	2899	96 10 21	2884	94 37 42	2869
21	α Arietis	W.	57 13 35	2661	58 51 7	2640	60 29 8	2618	62 7 39	2597
	Aldebaran	W.	23 18 3	2465	25 0 6	2450	26 42 30	2434	28 25 16	2419
	Regulus	E.	56 50 5	2466	55 8 4	2451	53 25 42	2436	51 42 58	2421
	SUN	E.	86 49 28	2790	85 14 47	2774	83 39 45	2758	82 4 22	2742
22	α Arietis	W.	70 27 8	2499	72 8 22	2482	73 50 1	2464	75 32 5	2447
	Aldebaran	W.	37 4 28	2344	38 49 24	2328	40 34 42	2313	42 20 22	2298
	Regulus	E.	43 3 59	2346	41 19 6	2331	39 33 52	2316	37 48 16	2301
	SUN	E.	74 2 5	2661	72 24 33	2645	70 46 39	2629	69 8 23	2613
23	α Arietis	W.	84 8 19	2367	85 52 41	2353	87 37 24	2339	89 22 27	2325
	Aldebaran	W.	51 14 6	2226	53 1 55	2212	54 50 4	2199	56 38 33	2186
	SUN	E.	60 51 44	2536	59 11 21	2522	57 30 38	2507	55 49 35	2494
24	Aldebaran	W.	65 45 51	2124	67 36 13	2113	69 26 52	2103	71 17 47	2092
	Pollux	W.	24 0 37	2569	25 40 15	2502	27 21 26	2445	29 3 56	2396
	SUN	E.	47 19 38	2430	45 36 46	2418	43 53 37	2408	42 10 13	2397
25	Aldebaran	W.	80 36 1	2050	82 28 18	2043	84 20 45	2037	86 13 22	2032
	Pollux	W.	37 50 49	2239	39 38 19	2217	41 26 21	2198	43 14 51	2182
	SUN	E.	33 29 51	2357	31 45 14	2351	30 0 28	2346	28 15 35	2342
29	SUN	W.	22 38 35	2504	24 19 43	2516	26 0 34	2530	27 41 6	2545
	α Aquilæ	E.	89 25 2	2643	87 47 5	2658	86 9 29	2675	84 32 16	2693
	Fomalhaut	E.	122 50 22	2693	121 11 58	2691	119 33 31	2690	117 55 3	2691
30	SUN	W.	35 58 23	2626	37 36 42	2645	39 14 36	2663	40 52 5	2682
	α Aquilæ	E.	76 32 50	2804	74 58 27	2829	73 24 37	2857	71 51 23	2885
	Fomalhaut	E.	109 44 5	2654	108 6 23	2665	106 28 56	2676	104 51 44	2689

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
18	Fomalhaut	W.	84° 41′ 23″	3047	86° 10′ 38″	3034	87° 40′ 8″	3022	89° 9′ 54″	3010
	α Pegasi	W.	70 0 17	3060	71 29 16	3043	72 58 36	3025	74 28 18	3008
	α Arietis	W.	27 3 27	3471	28 24 23	3386	29 46 55	3312	31 10 53	3247
	SATURN	E.	52 13 40	2772	50 38 36	2761.	49 3 17	2750	47 27 43	2739
	Pollux	E.	54 17 18	2845	52 43 48	2838	51 10 10	2833	49 36 25	2827
	Regulus	E.	89 43 0	2734	88 7 5	2722	86 30 55	2710	84 54 29	2698
	SUN	E.	117 15 48	3078	115 47 12	3066	114 18 21	3053	112 49 14	3041
19	Fomalhaut	W.	96 42 22	2953	98 13 34	2942	99 45 0	2931	101 16 39	2922
	α Pegasi	W.	82 1 54	2929	83 33 36	2913	85 5 38	2898	86 37 59	2884
	α Arietis	W.	38 27 41	3003	39 57 50	2965	41 28 46	2930	43 0 27	2898
	SATURN	E.	39 26 7	2681	37 49 1	2669	36 11 39	2657	34 34 1	2646
	Pollux	E.	41 45 54	2805	40 11 33	2805	38 37 11	2805	37 2 50	2808
	Regulus	E.	76 48 13	2636	75 10 7	2623	73 31 43	2609	71 53 0	2595
	SUN	E.	105 19 37	2973	103 48 50	2958	102 17 45	2944	100 46 22	2930
20	α Pegasi	W.	94 21 16	2815	95 58 24	2802	97 32 49	2790	99 7 30	2778
	α Arietis	W.	50 48 39	2756	52 24 5	2731	54 0 3	2707	55 36 33	2683
	SATURN	E.	26 22 1	2591	24 42 54	2582	23 3 34	2574	21 24 4	2569
	Pollux	E.	29 12 50	2861	27 39 41	2887	26 7 5	2920	24 35 12	2965
	Regulus	E.	63 34 41	2525	61 54 3	2510	60 13 4	2496	58 31 45	2481
	SUN	E.	93 4 44	2854	91 31 26	2838	89 57 47	2822	88 23 48	2806
21	α Arietis	W.	63 46 38	2577	65 26 5	2557	67 5 59	2538	68 46 20	2518
	Aldebaran	W.	30 8 23	2404	31 51 52	2389	33 35 42	2374	35 19 54	2359
	Regulus	E.	49 59 53	2406	48 16 27	2391	46 32 39	2376	44 48 30	2361
	SUN	E.	80 28 38	2725	78 52 32	2710	77 16 5	2693	75 39 16	2677
22	α Arietis	W.	77 14 33	2430	78 57 25	2414	80 40 40	2398	82 24 18	2382
	Aldebaran	W.	44 6 24	2284	45 52 47	2269	47 39 32	2255	49 26 38	2240
	Regulus	E.	36 2 18	2287	34 15 59	2272	32 29 19	2259	30 42 19	2245
	SUN	E.	67 29 46	2597	65 50 47	2582	64 11 27	2566	62 31 46	2551
23	α Arietis	W.	91 7 50	2312	92 53 32	2300	94 39 31	2289	96 25 47	2278
	Aldebaran	W.	58 27 22	2173	60 16 31	2160	62 5 59	2147	63 55 46	2136
	SUN	E.	54 8 13	2480	52 26 32	2467	50 44 32	2454	49 2 14	2441
24	Aldebaran	W.	73 8 58	2063	75 0 23	2074	76 52 2	2065	78 43 55	2057
	Pollux	W.	30 47 34	2357	32 32 11	2321	34 17 40	2289	36 3 55	2263
	SUN	E.	40 26 34	2387	38 42 41	2379	36 58 36	2371	35 14 19	2363
25	Aldebaran	W.	88 6 7	2026	89 59 0	2022	91 52 0	2019	93 45 5	2016
	Pollux	W.	45 3 45	2168	46 53 1	2155	48 42 36	2144	50 32 28	2135
	SUN	E.	26 30 36	2339	24 45 34	2337	23 0 29	2337	21 15 24	2339
29	SUN	W.	29 21 17	2560	31 1 7	2576	32 40 35	2592	34 19 41	2610
	α Aquilæ	E.	82 55 27	2713	81 19 4	2734	79 43 9	2756	78 7 44	2780
	Fomalhaut	E.	116 16 37	2625	114 38 16	2631	113 0 3	2638	111 21 59	2645
30	SUN	W.	42 29 9	2701	44 5 47	2720	45 42 0	2740	47 17 47	2759
	α Aquilæ	E.	70 18 45	2915	68 46 45	2946	67 15 25	2979	65 44 46	3013
	Fomalhaut	E.	103 14 49	2702	101 38 12	2716	100 1 53	2731	98 25 54	2746

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Frid.	1	12 30 11.38	9.062	S. 3 15 39.2	–58.26	16 1.49	64.37	10 20.87	0.792
Sat.	2	12 33 49.00	9.074	3 38 56.4	58.16	16 1.77	64.41	10 39.75	0.780
SUN.	3	12 37 26.94	9.087	4 2 11.2	58.05	16 2.06	64.46	10 58.32	0.767
Mon.	4	12 41 5.18	9.101	4 25 23.0	–57.92	16 2.35	64.51	11 16.58	0.753
Tues.	5	12 44 43.75	9.115	4 48 31.5	57.78	16 2.63	64.56	11 34.51	0.739
Wed.	6	12 48 22.68	9.130	5 11 36.3	57.63	16 2.91	64.62	11 52.09	0.724
Thur.	7	12 52 1.99	9.146	5 34 37.1	–57.46	16 3.19	64.68	12 9.28	0.708
Frid.	8	12 55 41.69	9.163	5 57 33.5	57.26	16 3.47	64.74	12 26.08	0.691
Sat.	9	12 59 21.82	9.181	6 20 25.3	57.05	16 3.75	64.81	12 42.46	0.673
SUN.	10	13 3 2.39	9.200	6 43 11.9	–56.83	16 4.03	64.88	12 58.39	0.654
Mon.	11	13 6 43.42	9.220	7 5 53.0	56.59	16 4.31	64.95	13 13.87	0.634
Tues.	12	13 10 24.94	9.241	7 28 28.3	56.34	16 4.59	65.02	13 28.87	0.613
Wed.	13	13 14 6.96	9.263	7 50 57.5	–56.08	16 4.86	65.10	13 43.36	0.591
Thur.	14	13 17 49.52	9.285	8 13 20.2	55.80	16 5.14	65.18	13 57.32	0.569
Frid.	15	13 21 32.62	9.308	8 35 36.0	55.51	16 5.41	65.26	14 10.73	0.546
Sat.	16	13 25 16.30	9.332	8 57 44.5	–55.20	16 5.68	65.34	14 23.57	0.522
SUN.	17	13 29 0.57	9.357	9 19 45.4	54.87	16 5.95	65.43	14 35.82	0.497
Mon.	18	13 32 45.46	9.383	9 41 38.3	54.53	16 6.22	65.52	14 47.45	0.471
Tues.	19	13 36 30.99	9.410	10 3 22.7	–54.17	16 6.48	65.61	14 58.45	0.444
Wed.	20	13 40 17.16	9.437	10 24 58.4	53.80	16 6.74	65.70	15 8.80	0.417
Thur.	21	13 44 4.00	9.465	10 46 25.1	53.41	16 7.00	65.80	15 18.48	0.389
Frid.	22	13 47 51.53	9.494	11 7 42.2	–53.00	16 7.26	65.90	15 27.49	0.360
Sat.	23	13 51 39.75	9.524	11 28 49.4	52.58	16 7.52	66.00	15 35.80	0.331
SUN.	24	13 55 28.68	9.554	11 49 46.2	52.14	16 7.78	66.10	15 43.39	0.301
Mon.	25	13 59 18.34	9.584	12 10 32.4	–51.69	16 8.04	66.20	15 50.27	0.271
Tues.	26	14 3 8.72	9.615	12 31 7.3	51.21	16 8.30	66.30	15 56.43	0.240
Wed.	27	14 6 59.84	9.646	12 51 30.7	50.72	16 8.56	66.41	16 1.85	0.209
Thur.	28	14 10 51.72	9.677	13 11 42.2	–50.21	16 8.82	66.52	16 6.51	0.178
Frid.	29	14 14 44.36	9.709	13 31 41.2	49.69	16 9.07	66.63	16 10.41	0.146
Sat.	30	14 18 37.76	9.741	13 51 27.3	49.14	16 9.33	66.74	16 13.55	0.114
SUN.	31	14 22 31.93	9.773	14 11 0.2	48.58	16 9.58	66.85	16 15.93	0.082
Mon.	32	14 26 26.88	9.806	S. 14 30 19.4	–48.00	16 9.84	66.96	16 17.54	0.049

Note.—The mean time of semidiameter passing may be found by subtracting $0^{s}.18$ from the sidereal time.
The sign – prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Frid.	1	12 30 12.95	9.064	S. 3 15 49.3	−58.27	10 21.00	0.792	12 40 33.95
Sat.	2	12 33 50.62	9.076	3 39 6.8	58.17	10 39.88	0.780	12 44 30.51
SUN.	3	12 37 28.60	9.089	4 2 21.8	58.06	10 58.46	0.767	12 48 27.06
Mon.	4	12 41 6.89	9.103	4 25 33.8	−57.93	11 16.72	0.753	12 52 23.61
Tues.	5	12 44 45.51	9.117	4 48 42.6	57.79	11 34.65	0.739	12 56 20.16
Wed.	6	12 48 24.49	9.132	5 11 47.7	57.64	11 52.23	0.724	13 0 16.72
Thur.	7	12 52 3.85	9.148	5 34 48.7	−57.47	12 9.42	0 708	13 4 13.27
Frid.	8	12 55 43.60	9.165	5 57 45.4	57.27	12 26.22	0.691	13 8 9.82
Sat.	9	12 59 23.77	9.183	6 20 37.4	57.06	12 42.60	0.673	13 12 6.37
SUN.	10	13 3 4.39	9.202	6 43 24.2	−56.84	12 58.53	0.654	13 16 2.92
Mon.	11	13 6 45.46	9.222	7 6 5.5	56.60	13 14.01	0.634	13 19 59.47
Tues.	12	13 10 27.02	9.243	7 28 41.0	56.35	13 29.01	0.613	13 23 56.03
Wed.	13	13 14 9.08	9.265	7 51 10.4	−56.09	13 43.50	0.591	13 27 52.58
Thur.	14	13 17 51.68	9.287	8 13 33.2	55.81	13 57.45	0.569	13 31 49.13
Frid.	15	13 21 34.82	9.310	8 35 49.1	55.52	14 10.86	0.546	13 35 45.68
Sat.	16	13 25 18.54	9.334	8 57 57.7	−55.21	14 23.70	0.522	13 39 42.24
SUN.	17	13 29 2.85	9.359	9 19 58.7	54.88	14 35.94	0.497	13 43 38.79
Mon.	18	13 32 47.78	9.385	9 41 51.7	54.53	14 47.57	0.471	13 47 35.35
Tues.	19	13 36 33.34	9.412	10 3 36.2	−54.17	14 58.56	0.444	13 51 31.89
Wed.	20	13 40 19.55	9.439	10 25 12.0	53.80	15 8.90	0.417	13 55 28.45
Thur.	21	13 44 6.42	9.467	10 46 38.7	53.41	15 18.58	0.389	13 59 25.00
Frid.	22	13 47 53.98	9.496	11 7 55.9	−53.00	15 27.58	0.360	14 3 21.56
Sat.	23	13 51 42.23	9.525	11 29 3.1	52.58	15 35.88	0.331	14 7 18.11
SUN.	24	13 55 31.19	9.555	11 49 59.9	52.14	15 43.47	0.301	14 11 14.66
Mon.	25	13 59 20.87	9.585	12 10 46.0	−51.69	15 50.34	0.271	14 15 11.21
Tues.	26	14 3 11.28	9.616	12 31 20.9	51.21	15 56.49	0.240	14 19 7.77
Wed.	27	14 7 2.42	9.647	12 51 44.2	50.72	16 1.90	0.209	14 23 4.32
Thur.	28	14 10 54.32	9.678	13 11 55.6	−50.21	16 6.56	0.178	14 27 0.88
Frid.	29	14 14 46.98	9.710	13 31 54.5	49.69	16 10.45	0.146	14 30 57.43
Sat.	30	14 18 40.40	9.742	13 51 40.5	49.14	16 13.58	0.114	14 34 53.98
SUN.	31	14 22 34.58	9.774	14 11 13.3	48.58	16 15.95	0.082	14 38 50.53
Mon.	32	14 26 29.54	9.807	S. 14 30 32.4	−48.00	16 17.55	0.049	14 42 47.09

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour, $+\,9^{s}.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	274	188 13 50.8	13 20.8	147.71	+ 0.83	0.0002294	− 52.8	11 17 34.74
2	275	189 12 56.9	12 26.9	147.79	0.85	0.0001024	53.0	11 13 38.83
3	276	190 12 4.8	11 34.7	147.87	0.83	9.9999750	53.2	11 9 42.92
4	277	191 11 14.5	10 44.3	147.95	+ 0.78	9.9998473	− 53.3	11 5 47.01
5	278	192 10 26.0	9 55.7	148.02	0.70	9.9997194	53.3	11 1 51.10
6	279	193 9 39.3	9 8.9	148.10	0.60	9.9995915	53.3	10 57 55.20
7	280	194 8 54.4	8 23.9	148.17	+ 0.48	9.9994637	− 53.2	10 53 59.30
8	281	195 8 11.3	7 40.7	148.24	0.35	9.9993362	53.0	10 50 3.39
9	282	196 7 29.9	6 59.2	148.31	0.22	9.9992092	52.8	10 46 7.49
10	283	197 6 50.3	6 19.5	148.39	+ 0.09	9.9990829	− 52.5	10 42 11.59
11	284	198 6 12.7	5 41.8	148.47	− 0.04	9.9989573	52.2	10 38 15.68
12	285	199 5 37.1	5 6.1	148.55	0.16	9.9988326	51.7	10 34 19.77
13	286	200 5 3.4	4 32.4	148.64	− 0.25	9.9987088	− 51.2	10 30 23.87
14	287	201 4 31.8	4 0.7	148.72	0.31	9.9985859	50.9	10 26 27.96
15	288	202 4 2.3	3 31.1	148.81	0.35	9.9984638	50.7	10 22 32.05
16	289	203 3 35.0	3 3.7	148.90	− 0.35	9.9983425	− 50.3	10 18 36.14
17	290	204 3 9.9	2 38.5	149.00	0.32	9.9982222	49.9	10 14 40.24
18	291	205 2 47.0	2 15.5	149.09	0.26	9.9981028	49.6	10 10 44.34
19	292	206 2 26.4	1 54.8	149.19	− 0.18	9.9979841	− 49.3	10 6 48.43
20	293	207 2 8.1	1 36.4	149.28	− 0.08	9.9978661	49.1	10 2 52.52
21	294	208 1 52.1	1 20.3	149.37	+ 0.03	9.9977486	48.9	9 58 56.61
22	295	209 1 38.4	1 6.5	149.46	+ 0.16	9.9976314	− 48.7	9 55 0.70
23	296	210 1 26.9	0 54.9	149.56	0.29	9.9975146	48.6	9 51 4.79
24	297	211 1 17.6	0 45.5	149.65	0.42	9.9973982	48.5	9 47 8.88
25	298	212 1 10.4	0 38.2	149.74	+ 0.55	9.9972820	− 48.4	9 43 12.97
26	299	213 1 5.3	0 33.0	149.82	0.65	9.9971661	48.3	9 39 17.07
27	300	214 1 2.2	0 29.8	149.90	0.72	9.9970504	48.2	9 35 21.16
28	301	215 1 1.1	0 28.6	149.98	+ 0.77	9.9969350	− 48.1	9 31 25.25
29	302	216 1 1.8	0 29.2	150.06	0.79	9.9968198	47.9	9 27 29.35
30	303	217 1 4.3	0 31.6	150.14	0.78	9.9967049	47.8	9 23 33.45
31	304	218 1 8.6	0 35.8	150.21	0.74	9.9965904	47.6	9 19 37.54
32	305	219 1 14.5	0 41.6	150.28	+ 0.68	9.9964765	− 47.3	9 15 41.63

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0d.0.

Diff. for 1 Hour, — 9s.8296. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 53.8	15 46.1	58 13.7	−2.34	57 45.5	−2.34	3 9.6	2.22	3.6
2	15 38.5	15 31.2	57 17.6	2.29	56 50.6	2.19	4 2.4	2.19	4.6
3	15 24.2	15 17.7	56 25.0	2.07	56 1.0	1.92	4 54.4	2.14	5.6
4	15 11.6	15 6.2	55 38.9	−1.75	55 19.0	−1.56	5 45.2	2.08	6.6
5	15 1.5	14 57.3	55 1.5	1.36	54 46.3	1.17	6 34.4	2.01	7.6
6	14 53.8	14 51.0	54 33.5	0.96	54 23.2	0.76	7 22.0	1.94	8.6
7	14 48.9	14 47.4	54 15.3	−0.56	54 9.7	−0.38	8 7.9	1.88	9.6
8	14 46.4	14 46.1	54 6.3	−0.19	54 5.1	−0.02	8 52.4	1.83	10.6
9	14 46.3	14 47.0	54 5.8	+0.13	54 8.3	+0.28	9 35.9	1.80	11.6
10	14 48.1	14 49.7	54 12.5	+0.42	54 18.3	+0.54	10 18.8	1.79	12.6
11	14 51.6	14 53.9	54 25.4	0.64	54 33.7	0.74	11 1.7	1.80	13.6
12	14 56.5	14 59.3	54 43.1	0.83	54 53.5	0.90	11 45.2	1.83	14.6
13	15 2.3	15 5.6	55 4.7	+0.96	55 16.6	+1.03	12 29.8	1.89	15.6
14	15 9.0	15 12.6	55 29.3	1.08	55 42.4	1.12	13 16.1	1.97	16.6
15	15 16.4	15 20.3	55 56.2	1.17	56 10.5	1.21	14 4.4	2.06	17.6
16	15 24.3	15 28.4	56 25.3	+1.26	56 40.6	+1.29	14 55.0	2.16	18.6
17	15 32.7	15 37.1	56 56.3	1.33	57 12.5	1.37	15 47.8	2.24	19.6
18	15 41.7	15 46.3	57 29.2	1.41	57 46.2	1.43	16 42.3	2.30	20.6
19	15 51.0	15 55.7	58 3.4	+1.44	58 20.7	+1.44	17 38.0	2.33	21.6
20	16 0.4	16 5.0	58 37.9	1.42	58 54.9	1.39	18 33.9	2.33	22.6
21	16 9.4	16 13.6	59 11.2	1.32	59 26.6	1.23	19 29.5	2.30	23.6
22	16 17.5	16 20.9	59 40.7	+1.10	59 53.1	+0.94	20 24.5	2.27	24.6
23	16 23.6	16 25.8	60 3.3	0.75	60 11.1	+0.53	21 18.8	2.25	25.6
24	16 27.1	16 27.5	60 15.9	+0.27	60 17.6	0.00	22 12.6	2.24	26.6
25	16 27.0	16 25.6	60 15.8	−0.30	60 10.5	−0.59	23 6.3	2.24	27.6
26	16 23.2	16 19.8	60 1.6	0.88	59 49.3	1.16	☌		28.6
27	16 15.6	16 10.6	59 33.8	1.41	59 15.4	1.63	0 0.2	2.25	0.2
28	16 4.9	15 58.7	58 54.6	−1.82	58 31.8	−1.96	0 54.4	2.26	1.2
29	15 52.2	15 45.4	58 7.7	2.04	57 42.8	2.09	1 48.6	2.26	2.2
30	15 38.5	15 31.7	57 17.5	2.10	56 52.5	2.06	2 42.4	2.22	3.2
31	15 25.1	15 18.8	56 28.2	−1.98	56 5.1	−1.86	3 35.2	2.17	4.2
32	15 12.9	15 7.5	55 43.5	−1.72	55 23.8	−1.56	4 26.4	2.09	5.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 1.					SUNDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 43 20.11	2.3045	S. 14 28 18.3	7.156	0	17 32 40.56	2.2429	S. 18 17 59.8	2.360
1	15 45 38.36	2.3037	14 35 24.8	7.062	1	17 34 55.08	2.2411	18 20 18.4	2.259
2	15 47 56.56	2.3028	14 42 25.7	6.967	2	17 37 9.49	2.2392	18 22 30.9	2.158
3	15 50 14.70	2.3019	14 49 20.9	6.872	3	17 39 23.79	2.2374	18 24 37.4	2.057
4	15 52 32.79	2.3011	14 56 10.3	6.776	4	17 41 37.98	2.2355	18 26 37.8	1.957
5	15 54 50.83	2.3002	15 2 54.0	6.680	5	17 43 52.05	2.2335	18 28 32.2	1.857
6	15 57 8.82	2.2993	15 9 31.9	6.583	6	17 46 6.00	2.2315	18 30 20.6	1.756
7	15 59 26.75	2.2984	15 16 4.0	6.487	7	17 48 19.83	2.2295	18 32 2.9	1.656
8	16 1 44.63	2.2976	15 22 30.3	6.390	8	17 50 33.54	2.2276	18 33 39.3	1.557
9	16 4 2.46	2.2967	15 28 50.8	6.292	9	17 52 47.14	2.2257	18 35 9.7	1.457
10	16 6 20.23	2.2957	15 35 5.4	6.194	10	17 55 0.62	2.2236	18 36 34.1	1.357
11	16 8 37.94	2.2947	15 41 14.1	6.097	11	17 57 13.97	2.2214	18 37 52.6	1.258
12	16 10 55.59	2.2937	15 47 17.0	5.999	12	17 59 27.19	2.2193	18 39 5.1	1.159
13	16 13 13.18	2.2927	15 53 14.0	5.900	13	18 1 40.29	2.2172	18 40 11.7	1.060
14	16 15 30.71	2.2916	15 59 5.0	5.800	14	18 3 53.26	2.2151	18 41 12.3	0.961
15	16 17 48.17	2.2905	16 4 50.0	5.701	15	18 6 6.10	2.2130	18 42 7.0	0.862
16	16 20 5.57	2.2895	16 10 29.1	5.602	16	18 8 18.82	2.2108	18 42 55.8	0.764
17	16 22 22.91	2.2884	16 16 2.2	5.502	17	18 10 31.40	2.2086	18 43 38.7	0.667
18	16 24 40.18	2.2872	16 21 29.3	5.402	18	18 12 43.85	2.2064	18 44 15.8	0.569
19	16 26 57.38	2.2861	16 26 50.4	5.302	19	18 14 56.17	2.2042	18 44 47.0	0.472
20	16 29 14.51	2.2849	16 32 5.5	5.202	20	18 17 8.35	2.2019	18 45 12.4	0.374
21	16 31 31.57	2.2838	16 37 14.6	5.101	21	18 19 20.40	2.1996	18 45 31.9	0.277
22	16 33 48.56	2.2826	16 42 17.6	5.000	22	18 21 32.31	2.1973	18 45 45.7	0.181
23	16 36 5.48	2.2813	S. 16 47 14.6	4.900	23	18 23 44.08	2.1950	S. 18 45 53.7	− 0.085
	SATURDAY 2.					MONDAY 4.			
0	16 38 22.32	2.2800	S. 16 52 5.6	4.799	0	18 25 55.71	2.1927	S. 18 45 55.9	+ 0.011
1	16 40 39.08	2.2788	16 56 50.5	4.697	1	18 28 7.20	2.1903	18 45 52.4	0.107
2	16 42 55.77	2.2775	17 1 29.3	4.596	2	18 30 18.55	2.1880	18 45 43.1	0.202
3	16 45 12.38	2.2762	17 6 2.0	4.494	3	18 32 29.76	2.1856	18 45 28.1	0.297
4	16 47 28.91	2.2748	17 10 28.6	4.393	4	18 34 40.82	2.1832	18 45 7.4	0.392
5	16 49 45.36	2.2735	17 14 49.2	4.292	5	18 36 51.74	2.1808	18 44 41.1	0.486
6	16 52 1.73	2.2721	17 19 3.7	4.191	6	18 39 2.52	2.1784	18 44 9.1	0.580
7	16 54 18.01	2.2707	17 23 12.1	4.089	7	18 41 13.15	2.1759	18 43 31.5	0.673
8	16 56 34.21	2.2692	17 27 14.4	3.987	8	18 43 23.63	2.1734	18 42 48.3	0.767
9	16 58 50.32	2.2677	17 31 10.5	3.884	9	18 45 33.96	2.1710	18 41 59.4	0.861
10	17 1 6.34	2.2662	17 35 0.5	3.782	10	18 47 44.15	2.1686	18 41 5.0	0.954
11	17 3 22.27	2.2648	17 38 44.4	3.681	11	18 49 54.19	2.1661	18 40 5.0	1.046
12	17 5 38.12	2.2633	17 42 22.2	3.579	12	18 52 4.08	2.1636	18 38 59.5	1.137
13	17 7 53.87	2.2618	17 45 53.9	3.477	13	18 54 13.82	2.1610	18 37 48.5	1.229
14	17 10 9.53	2.2602	17 49 19.5	3.376	14	18 56 23.40	2.1584	18 36 32.0	1.320
15	17 12 25.09	2.2585	17 52 39.0	3.274	15	18 58 32.83	2.1559	18 35 10.1	1.411
16	17 14 40.55	2.2568	17 55 52.4	3.172	16	19 0 42.11	2.1533	18 33 42.7	1.502
17	17 16 55.91	2.2552	17 58 59.7	3.070	17	19 2 51.23	2.1508	18 32 9.9	1.591
18	17 19 11.17	2.2535	18 2 0.8	2.968	18	19 5 0.20	2.1483	18 30 31.8	1.680
19	17 21 26.33	2.2518	18 4 55.8	2.867	19	19 7 9.02	2.1457	18 28 48.3	1.770
20	17 23 41.39	2.2501	18 7 44.8	2.766	20	19 9 17.68	2.1430	18 26 59.4	1.859
21	17 25 56.34	2.2483	18 10 27.7	2.664	21	19 11 26.18	2.1404	18 25 5.2	1.948
22	17 28 11.19	2.2466	18 13 4.5	2.562	22	19 13 34.53	2.1378	18 23 5.7	2.036
23	17 30 25.93	2.2448	18 15 35.2	2.461	23	19 15 42.72	2.1352	18 21 0.9	2.124
24	17 32 40.56	2.2429	S. 18 17 59.8	2.360	24	19 17 50.75	2.1325	S. 18 18 50.9	2.211

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 17 50.75	2.1325	S. 18 18 50.9	2.211
1	19 19 58.62	2.1298	18 16 35.6	2.297
2	19 22 6.33	2.1272	18 14 15.2	2.383
3	19 24 13.89	2.1246	18 11 49.6	2.469
4	19 26 21.29	2.1220	18 9 18.9	2.555
5	19 28 28.53	2.1193	18 6 43.0	2.641
6	19 30 35.61	2.1167	18 4 2.0	2.726
7	19 32 42.53	2.1140	18 1 15.9	2.810
8	19 34 49.29	2.1113	17 58 24.8	2.893
9	19 36 55.89	2.1087	17 55 28.7	2.977
10	19 39 2.33	2.1060	17 52 27.6	3.060
11	19 41 8.61	2.1032	17 49 21.5	3.142
12	19 43 14.72	2.1005	17 46 10.5	3.224
13	19 45 20.67	2.0978	17 42 54.6	3.306
14	19 47 26.46	2.0952	17 39 33.8	3.387
15	19 49 32.10	2.0926	17 36 8.1	3.468
16	19 51 37.57	2.0899	17 32 37.6	3.548
17	19 53 42.88	2.0873	17 29 2.3	3.627
18	19 55 48.04	2.0847	17 25 22.3	3.707
19	19 57 53.04	2.0819	17 21 37.5	3.786
20	19 59 57.87	2.0792	17 17 48.0	3.864
21	20 2 2.54	2.0765	17 13 53.8	3.942
22	20 4 7.05	2.0738	17 9 55.0	4.019
23	20 6 11.40	2.0712	S. 17 5 51.5	4.097

WEDNESDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	20 8 15.60	2.0686	S. 17 1 43.4	4.173
1	20 10 19.64	2.0660	16 57 30.7	4.249
2	20 12 23.52	2.0633	16 53 13.5	4.324
3	20 14 27.23	2.0606	16 48 51.8	4.399
4	20 16 30.79	2.0580	16 44 25.6	4.474
5	20 18 34.19	2.0554	16 39 54.9	4.548
6	20 20 37.44	2.0528	16 35 19.8	4.622
7	20 22 40.53	2.0502	16 30 40.3	4.695
8	20 24 43.46	2.0476	16 25 56.4	4.767
9	20 26 46.24	2.0450	16 21 8.2	4.840
10	20 28 48.86	2.0424	16 16 15.6	4.912
11	20 30 51.33	2.0398	16 11 18.8	4.983
12	20 32 53.64	2.0372	16 6 17.7	5.053
13	20 34 55.80	2.0347	16 1 12.4	5.123
14	20 36 57.81	2.0322	15 56 2.9	5.192
15	20 38 59.67	2.0297	15 50 49.3	5.262
16	20 41 1.38	2.0272	15 45 31.5	5.332
17	20 43 2.94	2.0347	15 40 9.5	5.401
18	20 45 4.34	2.0221	15 34 43.4	5.468
19	20 47 5.59	2.0197	15 29 13.3	5.535
20	20 49 6.70	2.0173	15 23 39.2	5.602
21	20 51 7.67	2.0149	15 18 1.1	5.668
22	20 53 8.49	2.0125	15 12 19.1	5.733
23	20 55 9.17	2.0101	15 6 33.1	5.799
24	20 57 9.70	2.0077	S. 15 0 43.2	5.864

THURSDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 57 9.70	2.0077	S. 15 0 43.2	5.864
1	20 59 10.09	2.0053	14 54 49.4	5.928
2	21 1 10.34	2.0029	14 48 51.8	5.992
3	21 3 10.44	2.0005	14 42 50.4	6.055
4	21 5 10.40	1.9982	14 36 45.2	6.118
5	21 7 10.23	1.9960	14 30 36.2	6.181
6	21 9 9.92	1.9937	14 24 23.5	6.242
7	21 11 9.47	1.9914	14 18 7.1	6.303
8	21 13 8.89	1.9892	14 11 47.1	6.364
9	21 15 8.17	1.9869	14 5 23.4	6.425
10	21 17 7.32	1.9847	13 58 56.1	6.484
11	21 19 6.34	1.9825	13 52 25.3	6.543
12	21 21 5.22	1.9803	13 45 50.9	6.602
13	21 23 3.98	1.9782	13 39 13.0	6.661
14	21 25 2.61	1.9761	13 32 31.6	6.718
15	21 27 1.11	1.9740	13 25 46.8	6.775
16	21 28 59.49	1.9719	13 18 58.6	6.832
17	21 30 57.74	1.9698	13 12 7.0	6.888
18	21 32 55.87	1.9678	13 5 12.0	6.944
19	21 34 53.88	1.9658	12 58 13.7	6.999
20	21 36 51.77	1.9638	12 51 12.1	7.054
21	21 38 49.54	1.9618	12 44 7.2	7.109
22	21 40 47.19	1.9599	12 36 59.0	7.162
23	21 42 44.73	1.9581	S. 12 29 47.7	7.215

FRIDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	21 44 42.16	1.9562	S. 12 22 33.2	7.267
1	21 46 39.48	1.9543	12 15 15.6	7.319
2	21 48 36.68	1.9524	12 7 54.9	7.371
3	21 50 33.77	1.9506	12 0 31.0	7.423
4	21 52 30.75	1.9488	11 53 4.1	7.473
5	21 54 27.63	1.9471	11 45 34.2	7.523
6	21 56 24.40	1.9454	11 38 1.3	7.573
7	21 58 21.07	1.9437	11 30 25.4	7.622
8	22 0 17.64	1.9419	11 22 46.6	7.671
9	22 2 14.10	1.9402	11 15 4.9	7.718
10	22 4 10.47	1.9386	11 7 20.4	7.765
11	22 6 6.74	1.9371	10 59 33.1	7.812
12	22 8 2.92	1.9356	10 51 43.0	7.858
13	22 9 59.01	1.9340	10 43 50.1	7.905
14	22 11 55.00	1.9324	10 35 54.4	7.951
15	22 13 50.90	1.9310	10 27 56.0	7.996
16	22 15 46.72	1.9296	10 19 54.9	8.040
17	22 17 42.45	1.9281	10 11 51.2	8.083
18	22 19 38.09	1.9267	10 3 44.9	8.126
19	22 21 33.65	1.9254	9 55 36.0	8.169
20	22 23 29.13	1.9241	9 47 24.6	8.212
21	22 25 24.54	1.9228	9 39 10.6	8.254
22	22 27 19.87	1.9215	9 30 54.1	8.295
23	22 29 15.12	1.9202	9 22 35.2	8.335
24	22 31 10.29	1.9189	S. 9 14 13.9	8.376

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 31 10.29	1.9189	S. 9 14 13.9	8.376
1	22 33 5.39	1.9178	9 5 50.1	8.416
2	22 35 0.43	1.9167	8 57 24.0	8.454
3	22 36 55.40	1.9156	8 48 55.6	8.493
4	22 38 50.30	1.9145	8 40 24.9	8.531
5	22 40 45.14	1.9135	8 31 51.9	8.568
6	22 42 39.92	1.9124	8 23 16.7	8.605
7	22 44 34.63	1.9113	8 14 39.3	8.642
8	22 46 29.28	1.9104	8 5 59.7	8.678
9	22 48 23.88	1.9096	7 57 18.0	8.713
10	22 50 18.43	1.9087	7 48 34.2	8.748
11	22 52 12.93	1.9079	7 39 48.3	8.783
12	22 54 7.38	1.9071	7 31 0.3	8.817
13	22 56 1.78	1.9062	7 22 10.3	8.849
14	22 57 56.13	1.9054	7 13 18.4	8.881
15	22 59 50.43	1.9047	7 4 24.6	8.912
16	23 1 44.69	1.9041	6 55 28.9	8.944
17	23 3 38.92	1.9035	6 46 31.3	8.976
18	23 5 33.11	1.9028	6 37 31.8	9.007
19	23 7 27.26	1.9022	6 28 30.5	9.036
20	23 9 21.38	1.9017	6 19 27.5	9.065
21	23 11 15.46	1.9012	6 10 22.7	9.094
22	23 13 9.52	1.9007	6 1 16.2	9.122
23	23 15 3.55	1.9002	S. 5 52 8.1	9.149

SUNDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 16 57.55	1.8998	S. 5 42 58.3	9.176
1	23 18 51.53	1.8995	5 33 46.9	9.202
2	23 20 45.49	1.8992	5 24 34.0	9.228
3	23 22 39.43	1.8988	5 15 19.5	9.254
4	23 24 33.35	1.8985	5 6 3.5	9.278
5	23 26 27.25	1.8983	4 56 46.1	9.302
6	23 28 21.14	1.8981	4 47 27.2	9.326
7	23 30 15.02	1.8979	4 38 6.9	9.349
8	23 32 8.89	1.8978	4 28 45.3	9.371
9	23 34 2.76	1.8978	4 19 22.4	9.393
10	23 35 56.63	1.8977	4 9 58.1	9.415
11	23 37 50.49	1.8977	4 0 32.6	9.435
12	23 39 44.35	1.8977	3 51 5.9	9.455
13	23 41 38.21	1.8978	3 41 38.0	9.475
14	23 43 32.08	1.8979	3 32 8.9	9.494
15	23 45 25.96	1.8980	3 22 38.7	9.512
16	23 47 19.84	1.8982	3 13 7.4	9.530
17	23 49 13.74	1.8984	3 3 35.1	9.547
18	23 51 7.65	1.8987	2 54 1.8	9.563
19	23 53 1.58	1.8969	2 44 27.5	9.579
20	23 54 55.52	1.8992	2 34 52.3	9.595
21	23 56 49.48	1.8996	2 25 16.1	9.611
22	23 58 43.47	1.9000	2 15 39.0	9.625
23	0 0 37.48	1.9004	2 6 1.1	9.638
24	0 2 31.52	1.9009	S. 1 56 22.5	9.650

MONDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 2 31.52	1.9009	S. 1 56 22.5	9.650
1	0 4 25.59	1.9014	1 46 43.1	9.663
2	0 6 19.69	1.9019	1 37 3.0	9.675
3	0 8 13.82	1.9025	1 27 22.1	9.686
4	0 10 7.99	1.9031	1 17 40.6	9.696
5	0 12 2.19	1.9037	1 7 58.6	9.705
6	0 13 56.43	1.9044	0 58 16.0	9.715
7	0 15 50.72	1.9052	0 48 32.8	9.723
8	0 17 45.05	1.9059	0 38 49.2	9.731
9	0 19 39.43	1.9067	0 29 5.1	9.738
10	0 21 33.86	1.9076	0 19 20.6	9.745
11	0 23 28.34	1.9084	S. 0 9 35.7	9.752
12	0 25 22.87	1.9093	N. 0 0 9.6	9.757
13	0 27 17.46	1.9102	0 9 55.2	9.762
14	0 29 12.10	1.9112	0 19 41.0	9.765
15	0 31 6.81	1.9123	0 29 27.0	9.768
16	0 33 1.58	1.9134	0 39 13.2	9.771
17	0 34 56.42	1.9145	0 48 59.6	9.774
18	0 36 51.32	1.9156	0 58 46.1	9.775
19	0 38 46.29	1.9167	1 8 32.6	9.776
20	0 40 41.33	1.9179	1 18 19.2	9.777
21	0 42 36.44	1.9192	1 28 5.8	9.777
22	0 44 31.63	1.9205	1 37 52.4	9.775
23	0 46 26.90	1.9218	N. 1 47 38.8	9.772

TUESDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 48 22.25	1.9232	N. 1 57 25.1	9.770
1	0 50 17.68	1.9246	2 7 11.2	9.767
2	0 52 13.20	1.9260	2 16 57.1	9.763
3	0 54 8.80	1.9274	2 26 42.8	9.759
4	0 56 4.49	1.9289	2 36 28.2	9.753
5	0 58 0.27	1.9305	2 46 13.2	9.747
6	0 59 56.15	1.9321	2 55 57.9	9.741
7	1 1 52.13	1.9337	3 5 42.1	9.734
8	1 3 48.20	1.9353	3 15 25.9	9.726
9	1 5 44.37	1.9370	3 25 9.2	9.717
10	1 7 40.64	1.9387	3 34 52.0	9.708
11	1 9 37.02	1.9405	3 44 34.2	9.698
12	1 11 33.50	1.9423	3 54 15.7	9.687
13	1 13 30.09	1.9441	4 3 56.6	9.676
14	1 15 26.79	1.9460	4 13 36.8	9.663
15	1 17 23.61	1.9479	4 23 16.2	9.650
16	1 19 20.54	1.9498	4 32 54.8	9.637
17	1 21 17.59	1.9517	4 42 32.6	9.622
18	1 23 14.75	1.9537	4 52 9.5	9.607
19	1 25 12.03	1.9558	5 1 45.5	9.592
20	1 27 9.44	1.9579	5 11 20.5	9.575
21	1 29 6.98	1.9600	5 20 54.5	9.558
22	1 31 4.64	1.9621	5 30 27.5	9.540
23	1 33 2.43	1.9643	5 39 59.3	9.521
24	1 35 0.36	1.9666	N. 5 49 30.0	9.502

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 35 0.36	1.9666	N. 5 49 30.0	9.502
1	1 36 58.42	1.9688	5 58 59.5	9.482
2	1 38 56.61	1.9710	6 8 27.8	9.461
3	1 40 54.94	1.9733	6 17 54.8	9.438
4	1 42 53.41	1.9757	6 27 20.4	9.416
5	1 44 52.02	1.9781	6 36 44.7	9.393
6	1 46 50.78	1.9805	6 46 7.6	9.369
7	1 48 49.68	1.9829	6 55 29.0	9.344
8	1 50 48.73	1.9854	7 4 48.9	9.318
9	1 52 47.93	1.9879	7 14 7.2	9.293
10	1 54 47.28	1.9904	7 23 24.0	9.267
11	1 56 46.78	1.9930	7 32 39.2	9.239
12	1 58 46.44	1.9956	7 41 52.7	9.210
13	2 0 46.26	1.9982	7 51 4.4	9.181
14	2 2 46.23	2.0008	8 0 14.4	9.152
15	2 4 46.36	2.0035	8 9 22.6	9.121
16	2 6 46.65	2.0063	8 18 28.9	9.088
17	2 8 47.11	2.0091	8 27 33.2	9.055
18	2 10 47.74	2.0119	8 36 35.5	9.022
19	2 12 48.54	2.0146	8 45 35.8	8.988
20	2 14 49.50	2.0174	8 54 34.1	8.954
21	2 16 50.63	2.0203	9 3 30.3	8.918
22	2 18 51.93	2.0232	9 12 24.3	8.882
23	2 20 53.41	2.0262	N. 9 21 16.2	8.846

THURSDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	2 22 55.07	2.0292	N. 9 30 5.8	8.808
1	2 24 56.91	2.0321	9 38 53.1	8.769
2	2 26 58.92	2.0350	9 47 38.1	8.730
3	2 29 1.11	2.0380	9 56 20.7	8.689
4	2 31 3.48	2.0411	10 5 0.8	8.648
5	2 33 6.04	2.0442	10 13 38.4	8.606
6	2 35 8.78	2.0473	10 22 13.5	8.563
7	2 37 11.71	2.0504	10 30 46.0	8.520
8	2 39 14.83	2.0535	10 39 15.9	8.476
9	2 41 18.13	2.0566	10 47 43.1	8.431
10	2 43 21.62	2.0598	10 56 7.6	8.385
11	2 45 25.31	2.0631	11 4 29.3	8.338
12	2 47 29.19	2.0663	11 12 48.2	8.291
13	2 49 33.26	2.0695	11 21 4.2	8.242
14	2 51 37.53	2.0728	11 29 17.3	8.193
15	2 53 42.00	2.0762	11 37 27.4	8.143
16	2 55 46.67	2.0795	11 45 34.5	8.092
17	2 57 51.54	2.0827	11 53 38.5	8.041
18	2 59 56.60	2.0860	12 1 39.4	7.988
19	3 2 1.86	2.0894	12 9 37.1	7.935
20	3 4 7.33	2.0929	12 17 31.6	7.881
21	3 6 13.01	2.0963	12 25 22.8	7.826
22	3 8 18.89	2.0997	12 33 10.7	7.771
23	3 10 24.97	2.1031	12 40 55.3	7.715
24	3 12 31.26	2.1066	N.12 48 36.5	7.657

FRIDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 12 31.26	2.1066	N.12 48 36.5	7.657
1	3 14 37.76	2.1100	12 56 14.2	7.599
2	3 16 44.46	2.1134	13 3 48.4	7.540
3	3 18 51.37	2.1169	13 11 19.0	7.480
4	3 20 58.49	2.1205	13 18 46.0	7.419
5	3 23 5.83	2.1240	13 26 9.3	7.358
6	3 25 13.37	2.1274	13 33 29.0	7.297
7	3 27 21.12	2.1310	13 40 44.9	7.233
8	3 29 29.09	2.1346	13 47 57.0	7.169
9	3 31 37.27	2.1381	13 55 5.2	7.104
10	3 33 45.66	2.1416	14 2 9.5	7.039
11	3 35 54.26	2.1452	14 9 9.9	6.973
12	3 38 3.08	2.1488	14 16 6.3	6.907
13	3 40 12.12	2.1524	14 22 58.7	6.838
14	3 42 21.37	2.1559	14 29 46.9	6.769
15	3 44 30.83	2.1595	14 36 31.0	6.700
16	3 46 40.51	2.1631	14 43 10.9	6.630
17	3 48 50.40	2.1667	14 49 46.6	6.559
18	3 51 0.51	2.1702	14 56 18.0	6.487
19	3 53 10.83	2.1738	15 2 45.1	6.414
20	3 55 21.37	2.1775	15 9 7.7	6.340
21	3 57 32.13	2.1811	15 15 25.9	6.266
22	3 59 43.10	2.1847	15 21 39.6	6.191
23	4 1 54.29	2.1883	N.15 27 48.8	6.116

SATURDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	4 4 5.70	2.1919	N.15 33 53.5	6.039
1	4 6 17.32	2.1954	15 39 53.5	5.961
2	4 8 29.15	2.1990	15 45 48.8	5.882
3	4 10 41.20	2.2026	15 51 39.4	5.804
4	4 12 53.46	2.2062	15 57 25.3	5.725
5	4 15 5.94	2.2097	16 3 6.4	5.644
6	4 17 18.63	2.2132	16 8 42.6	5.563
7	4 19 31.53	2.2168	16 14 13.9	5.481
8	4 21 44.65	2.2204	16 19 40.3	5.398
9	4 23 57.98	2.2239	16 25 1.7	5.314
10	4 26 11.52	2.2274	16 30 18.0	5.229
11	4 28 25.27	2.2309	16 35 29.2	5.145
12	4 30 39.23	2.2344	16 40 35.4	5.060
13	4 32 53.40	2.2379	16 45 36.4	4.973
14	4 35 7.78	2.2413	16 50 32.1	4.885
15	4 37 22.36	2.2448	16 55 22.6	4.797
16	4 39 37.15	2.2483	17 0 7.8	4.709
17	4 41 52.15	2.2517	17 4 47.7	4.620
18	4 44 7.35	2.2550	17 9 22.2	4.529
19	4 46 22.75	2.2583	17 13 51.2	4.438
20	4 48 38.35	2.2617	17 18 14.8	4.347
21	4 50 54.16	2.2651	17 22 32.9	4.255
22	4 53 10.17	2.2684	17 26 45.4	4.162
23	4 55 26.37	2.2717	17 30 52.3	4.068
24	4 57 42.77	2.2749	N.17 34 53.6	3.974

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 17.					**TUESDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 57 42.77	2.2749	N.17 34 53.6	3.974	0	6 50 3.58	2.3905	N.18 46 32.3	1.154
1	4 59 59.36	2.2782	17 38 49.2	3.879	1	6 52 27.05	2.3918	18 45 19.6	1.269
2	5 2 16.15	2.2815	17 42 39.1	3.783	2	6 54 50.60	2.3931	18 44 0.0	1.383
3	5 4 33.14	2.2847	17 46 23.2	3.687	3	6 57 14.23	2.3944	18 42 33.6	1.498
4	5 6 50.32	2.2878	17 50 1.6	3.591	4	6 59 37.93	2.3955	18 41 0.3	1.613
5	5 9 7.68	2.2909	17 53 34.1	3.494	5	7 2 1.69	2.3966	18 39 20.0	1.729
6	5 11 25.23	2.2941	17 57 0.8	3.396	6	7 4 25.52	2.3977	18 37 32.8	1.844
7	5 13 42.97	2.2972	18 0 21.6	3.297	7	7 6 49.42	2.3987	18 35 38.7	1.959
8	5 16 0.89	2.3002	18 3 36.4	3.198	8	7 9 13.37	2.3997	18 33 37.7	2.074
9	5 18 19.00	2.3033	18 6 45.3	3.098	9	7 11 37.38	2.4006	18 31 29.8	2.190
10	5 20 37.29	2.3062	18 9 48.2	2.997	10	7 14 1.44	2.4014	18 29 14.9	2.306
11	5 22 55.75	2.3092	18 12 45.0	2.896	11	7 16 25.55	2.4023	18 26 53.1	2.421
12	5 25 14.39	2.3122	18 15 35.7	2.794	12	7 18 49.72	2.4031	18 24 24.4	2.536
13	5 27 33.21	2.3151	18 18 20.3	2.692	13	7 21 13.93	2.4038	18 21 48.8	2.651
14	5 29 52.20	2.3179	18 20 58.8	2.590	14	7 23 38.18	2.4045	18 19 6.3	2.767
15	5 32 11.36	2.3207	18 23 31.1	2.487	15	7 26 2.47	2.4051	18 16 16.8	2.882
16	5 34 30.69	2.3235	18 25 57.2	2.383	16	7 28 26.79	2.4057	18 13 20.5	2.996
17	5 36 50.18	2.3262	18 28 17.0	2.278	17	7 30 51.15	2.4062	18 10 17.3	3.111
18	5 39 9.84	2.3290	18 30 30.5	2.173	18	7 33 15.54	2.4067	18 7 7.2	3.226
19	5 41 29.66	2.3317	18 32 37.7	2.068	19	7 35 39.96	2.4072	18 3 50.2	3.340
20	5 43 49.64	2.3343	18 34 38.6	1.963	20	7 38 4.40	2.4076	18 0 26.4	3.454
21	5 46 9.78	2.3369	18 36 33.2	1.857	21	7 40 28.87	2.4079	17 56 55.7	3.569
22	5 48 30.07	2.3394	18 38 21.4	1.749	22	7 42 53.35	2.4082	17 53 18.1	3.683
23	5 50 50.51	2.3420	N.18 40 3.1	1.641	23	7 45 17.85	2.4085	N.17 49 33.7	3.797
	MONDAY 18.					**WEDNESDAY 20.**			
0	5 53 11.11	2.3446	N.18 41 38.3	1.533	0	7 47 42.37	2.4087	N.17 45 42.5	3.910
1	5 55 31.86	2.3470	18 43 7.1	1.426	1	7 50 6.90	2.4088	17 41 44.5	4.023
2	5 57 52.75	2.3493	18 44 29.4	1.317	2	7 52 31.43	2.4089	17 37 39.7	4.137
3	6 0 13.78	2.3517	18 45 45.2	1.208	3	7 54 55.97	2.4090	17 33 28.1	4.250
4	6 2 34.95	2.3540	18 46 54.4	1.098	4	7 57 20.51	2.4091	17 29 9.7	4.362
5	6 4 56.26	2.3562	18 47 57.0	0.989	5	7 59 45.06	2.4092	17 24 44.6	4.474
6	6 7 17.70	2.3584	18 48 53.1	0.879	6	8 2 9.61	2.4091	17 20 12.8	4.586
7	6 9 39.27	2.3606	18 49 42.5	0.768	7	8 4 34.15	2.4089	17 15 34.3	4.697
8	6 12 0.97	2.3627	18 50 25.3	0.658	8	8 6 58.68	2.4087	17 10 49.1	4.809
9	6 14 22.80	2.3649	18 51 1.5	0.547	9	8 9 23.20	2.4086	17 5 57.2	4.920
10	6 16 44.76	2.3670	18 51 31.0	0.435	10	8 11 47.71	2.4084	17 0 58.7	5.030
11	6 19 6.84	2.3690	18 51 53.7	0.323	11	8 14 12.21	2.4082	16 55 53.6	5.141
12	6 21 29.04	2.3709	18 52 9.7	0.211	12	8 16 36.70	2.4080	16 50 41.8	5.251
13	6 23 51.35	2.3728	18 52 19.0	+ 0.098	13	8 19 1.17	2.4076	16 45 23.4	5.360
14	6 26 13.77	2.3747	18 52 21.5	− 0.014	14	8 21 25.61	2.4072	16 39 58.6	5.468
15	6 28 36.31	2.3765	18 52 17.3	0.127	15	8 23 50.02	2.4068	16 34 27.3	5.576
16	6 30 58.95	2.3782	18 52 6.3	0.240	16	8 26 14.43	2.4064	16 28 49.5	5.684
17	6 33 21.69	2.3799	18 51 48.5	0.353	17	8 28 38.80	2.4059	16 23 5.2	5.792
18	6 35 44.54	2.3816	18 51 23.9	0.467	18	8 31 3.14	2.4054	16 17 14.5	5.898
19	6 38 7.49	2.3833	18 50 52.4	0.581	19	8 33 27.45	2.4049	16 11 17.4	6.005
20	6 40 30.53	2.3848	18 50 14.1	0.695	20	8 35 51.73	2.4044	16 5 13.9	6.111
21	6 42 53.66	2.3863	18 49 29.0	0.809	21	8 38 15.98	2.4038	15 59 4.1	6.216
22	6 45 16.88	2.3878	18 48 37.0	0.924	22	8 40 40.19	2.4032	15 52 48.0	6.321
23	6 47 40.19	2.3892	18 47 38.1	1.039	23	8 43 4.36	2.4025	15 46 25.6	6.426
24	6 50 3.58	2.3905	N.18 46 32.3	1.154	24	8 45 28.49	2.4018	N.15 39 56.9	6.530

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 45 28.49	2.4018	N.15 39 56.9	6.529
1	8 47 52.58	2.4011	15 33 22.1	6.632
2	8 50 16.62	2.4003	15 26 41.1	6.734
3	8 52 40.62	2.3996	15 19 54.0	6.836
4	8 55 4.57	2.3988	15 13 0.8	6.937
5	8 57 28.48	2.3981	15 6 1.6	7.038
6	8 59 52.34	2.3972	14 58 56.3	7.138
7	9 2 16.15	2.3963	14 51 45.0	7.236
8	9 4 39.90	2.3954	14 44 27.9	7.334
9	9 7 3.60	2.3946	14 37 4.9	7.432
10	9 9 27.25	2.3937	14 29 36.0	7.530
11	9 11 50.84	2.3928	14 22 1.3	7.626
12	9 14 14.38	2.3918	14 14 20.9	7.721
13	9 16 37.86	2.3908	14 6 34.8	7.816
14	9 19 1.27	2.3898	13 58 43.0	7.910
15	9 21 24.63	2.3888	13 50 45.6	8.003
16	9 23 47.93	2.3877	13 42 42.6	8.096
17	9 26 11.16	2.3867	13 34 34.1	8.187
18	9 28 34.33	2.3857	13 26 20.2	8.277
19	9 30 57.44	2.3846	13 18 0.8	8.367
20	9 33 20.48	2.3835	13 9 36.1	8.456
21	9 35 43.46	2.3824	13 1 6.1	8.544
22	9 38 6.37	2.3813	12 52 30.8	8.632
23	9 40 29.22	2.3802	N.12 43 50.3	8.718

FRIDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 42 52.00	2.3791	N.12 35 4.7	8.803
1	9 45 14.71	2.3780	12 26 14.0	8.888
2	9 47 37.36	2.3769	12 17 18.2	8.972
3	9 49 59.94	2.3757	12 8 17.4	9.054
4	9 52 22.45	2.3746	11 59 11.7	9.135
5	9 54 44.89	2.3735	11 50 1.2	9.214
6	9 57 7.27	2.3724	11 40 46.0	9.293
7	9 59 29.58	2.3712	11 31 26.0	9.373
8	10 1 51.81	2.3700	11 22 1.2	9.451
9	10 4 13.98	2.3689	11 12 31.8	9.528
10	10 6 36.08	2.3677	11 2 57.8	9.604
11	10 8 58.11	2.3666	10 53 19.3	9.678
12	10 11 20.07	2.3654	10 43 36.4	9.752
13	10 13 41.96	2.3643	10 33 49.1	9.824
14	10 16 3.78	2.3632	10 23 57.5	9.895
15	10 18 25.54	2.3621	10 14 1.7	9.965
16	10 20 47.23	2.3609	10 4 1.7	10.035
17	10 23 8.85	2.3598	9 53 57.5	10.103
18	10 25 30.41	2.3587	9 43 49.3	10.169
19	10 27 51.90	2.3576	9 33 37.2	10.235
20	10 30 13.32	2.3565	9 23 21.1	10.301
21	10 32 34.68	2.3554	9 13 1.1	10.365
22	10 34 55.97	2.3543	9 2 37.3	10.427
23	10 37 17.20	2.3532	8 52 9.9	10.487
24	10 39 38.36	2.3522	N. 8 41 38.9	10.547

SATURDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 39 38.36	2.3522	N. 8 41 38.9	10.547
1	10 41 59.46	2.3512	8 31 4.3	10.607
2	10 44 20.50	2.3501	8 20 26.1	10.665
3	10 46 41.47	2.3491	8 9 44.5	10.721
4	10 49 2.39	2.3481	7 58 59.6	10.776
5	10 51 23.25	2.3471	7 48 11.4	10.830
6	10 53 44.04	2.3460	7 37 20.0	10.883
7	10 56 4.77	2.3451	7 26 25.5	10.935
8	10 58 25.45	2.3442	7 15 27.8	10.985
9	11 0 46.07	2.3432	7 4 27.2	11.035
10	11 3 6.63	2.3423	6 53 23.6	11.083
11	11 5 27.14	2.3414	6 42 17.2	11.129
12	11 7 47.60	2.3405	6 31 8.1	11.174
13	11 10 8.00	2.3396	6 19 56.3	11.219
14	11 12 28.35	2.3387	6 8 41.8	11.262
15	11 14 48.65	2.3379	5 57 24.8	11.303
16	11 17 8.90	2.3371	5 46 5.4	11.343
17	11 19 29.10	2.3363	5 34 43.6	11.382
18	11 21 49.25	2.3355	5 23 19.5	11.420
19	11 24 9.36	2.3347	5 11 53.2	11.457
20	11 26 29.42	2.3339	5 0 24.7	11.492
21	11 28 49.43	2.3332	4 48 54.2	11.525
22	11 31 9.40	2.3325	4 37 21.7	11.558
23	11 33 29.33	2.3318	N. 4 25 47.2	11.590

SUNDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 35 49.22	2.3312	N. 4 14 10.9	11.619
1	11 38 9.07	2.3305	4 2 32.9	11.647
2	11 40 28.88	2.3299	3 50 53.2	11.675
3	11 42 48.66	2.3293	3 39 11.9	11.701
4	11 45 8.40	2.3287	3 27 29.1	11.725
5	11 47 28.11	2.3282	3 15 44.9	11.747
6	11 49 47.78	2.3276	3 3 59.4	11.769
7	11 52 7.42	2.3271	2 52 12.6	11.790
8	11 54 27.03	2.3267	2 40 24.6	11.808
9	11 56 46.62	2.3262	2 28 35.6	11.825
10	11 59 6.18	2.3257	2 16 45.6	11.842
11	12 1 25.71	2.3253	2 4 54.6	11.857
12	12 3 45.22	2.3250	1 53 2.7	11.871
13	12 6 4.71	2.3246	1 41 10.1	11.883
14	12 8 24.17	2.3242	1 29 16.8	11.893
15	12 10 43.61	2.3238	1 17 22.9	11.902
16	12 13 3.03	2.3235	1 5 28.5	11.910
17	12 15 22.43	2.3232	0 53 33.7	11.917
18	12 17 41.82	2.3230	0 41 38.5	11.922
19	12 20 1.19	2.3228	0 29 43.0	11.926
20	12 22 20.55	2.3226	0 17 47.4	11.927
21	12 24 39.90	2.3224	N. 0 5 51.7	11.928
22	12 26 59.24	2.3222	S. 0 6 4.0	11.927
23	12 29 18.56	2.3220	0 17 59.6	11.926
24	12 31 37.87	2.3218	S. 0 29 55.1	11.923

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 25.					**WEDNESDAY 27.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 31 37.87	2.3218	S. 0 29 55.1	11.923	0	14 23 16.43	2.3346	S. 9 32 28.3	10.183
1	12 33 57.18	2.3217	0 41 50.4	11.918	1	14 25 36.52	2.3351	9 42 37.3	10.117
2	12 36 16.48	2.3217	0 53 45.3	11.912	2	14 27 56.64	2.3355	9 52 42.3	10.049
3	12 38 35.78	2.3217	1 5 39.8	11.904	3	14 30 16.78	2.3359	10 2 43.2	9.980
4	12 40 55.08	2.3216	1 17 33.8	11.895	4	14 32 36.95	2.3364	10 12 39.9	9.910
5	12 43 14.37	2.3215	1 29 27.2	11.885	5	14 34 57.15	2.3368	10 22 32.4	9.840
6	12 45 33.66	2.3215	1 41 20.0	11.873	6	14 37 17.37	2.3372	10 32 20.7	9.768
7	12 47 52.95	2.3216	1 53 12.0	11.860	7	14 39 37.62	2.3376	10 42 4.6	9.695
8	12 50 12.25	2.3217	2 5 3.2	11.846	8	14 41 57.89	2.3380	10 51 44.1	9.621
9	12 52 31.55	2.3217	2 16 53.5	11.830	9	14 44 18.18	2.3384	11 1 19.1	9.546
10	12 54 50.85	2.3217	2 28 42.8	11.812	10	14 46 38.50	2.3388	11 10 49.6	9.470
11	12 57 10.16	2.3218	2 40 31.0	11.794	11	14 48 58.84	2.3392	11 20 15.5	9.392
12	12 59 29.47	2.3219	2 52 18.1	11.774	12	14 51 19.20	2.3395	11 29 36.7	9.314
13	13 1 48.79	2.3221	3 4 3.9	11.752	13	14 53 39.58	2.3398	11 38 53.2	9.236
14	13 4 8.12	2.3222	3 15 48.4	11.730	14	14 55 59.98	2.3402	11 48 5.0	9.157
15	13 6 27.46	2.3224	3 27 31.5	11.706	15	14 58 20.41	2.3406	11 57 12.0	9.076
16	13 8 46.81	2.3226	3 39 13.1	11.681	16	15 0 40.85	2.3409	12 6 14.1	8.994
17	13 11 6.17	2.3228	3 50 53.2	11.654	17	15 3 1.31	2.3412	12 15 11.3	8.912
18	13 13 25.55	2.3231	4 2 31.6	11.625	18	15 5 21.79	2.3415	12 24 3.5	8.828
19	13 15 44.94	2.3233	4 14 8.2	11.596	19	15 7 42.29	2.3417	12 32 50.7	8.744
20	13 18 4.34	2.3235	4 25 43.1	11.566	20	15 10 2.80	2.3419	12 41 32.8	8.658
21	13 20 23.76	2.3238	4 37 16.1	11.533	21	15 12 23.32	2.3421	12 50 9.7	8.572
22	13 22 43.20	2.3241	4 48 47.1	11.500	22	15 14 43.85	2.3423	12 58 41.4	8.486
23	13 25 2.65	2.3243	S. 5 0 16.1	11.465	23	15 17 4.40	2.3426	S. 13 7 8.0	8.399
	TUESDAY 26.					**THURSDAY 28.**			
0	13 27 22.12	2.3247	S. 5 11 42.9	11.428	0	15 19 24.96	2.3427	S. 13 15 29.3	8.310
1	13 29 41.61	2.3250	5 23 7.5	11.391	1	15 21 45.53	2.3428	13 23 45.2	8.221
2	13 32 1.12	2.3253	5 34 29.8	11.352	2	15 24 6.10	2.3429	13 31 55.8	8.132
3	13 34 20.65	2.3257	5 45 49.8	11.312	3	15 26 26.68	2.3431	13 40 1.0	8.042
4	13 36 40.20	2.3260	5 57 7.3	11.271	4	15 28 47.27	2.3432	13 48 0.8	7.950
5	13 38 59.77	2.3264	6 8 22.3	11.228	5	15 31 7.86	2.3432	13 55 55.0	7.857
6	13 41 19.37	2.3268	6 19 34.7	11.184	6	15 33 28.45	2.3432	14 3 43.7	7.765
7	13 43 38.99	2.3272	6 30 44.4	11.139	7	15 35 49.05	2.3432	14 11 26.8	7.672
8	13 45 58.63	2.3276	6 41 51.4	11.092	8	15 38 9.64	2.3432	14 19 4.3	7.577
9	13 48 18.30	2.3280	6 52 55.5	11.044	9	15 40 30.23	2.3431	14 26 36.1	7.482
10	13.50 37.99	2.3284	7 3 56.7	10.996	10	15 42 50.81	2.3430	14 34 2.2	7.387
11	13 52 57.71	2.3288	7 14 55.0	10.946	11	15 45 11.39	2.3429	14 41 22.6	7.292
12	13 55 17.45	2.3292	7 25 50.2	10.893	12	15 47 31.96	2.3427	14 48 37.2	7.195
13	13 57 37.22	2.3297	7 36 42.2	10.840	13	15 49 52.52	2.3426	14 55 46.0	7.097
14	13 59 57.01	2.3301	7 47 31.0	10.787	14	15 52 13.07	2.3424	15 2 48.9	7.000
15	14 2 16.83	2.3306	7 58 16.6	10.732	15	15 54 33.61	2.3422	15 9 46.0	6.902
16	14 4 36.68	2.3310	8 8 58.9	10.677	16	15 56 54.13	2.3419	15 16 37.2	6.803
17	14 6 56.55	2.3314	8 19 37.8	10.619	17	15 59 14.64	2.3417	15 23 22.4	6.704
18	14 9 16.45	2.3319	8 30 13.2	10.560	18	16 1 35.13	2.3413	15 30 1.7	6.605
19	14 11 36.38	2.3324	8 40 45.0	10.500	19	16 3 55.60	2.3409	15 36 35.0	6.504
20	14 13 56.34	2.3328	8 51 13.2	10.439	20	16 6 16.04	2.3405	15 43 2.2	6.403
21	14 16 16.32	2.3332	9 1 37.7	10.377	21	16 8 36.46	2.3401	15 49 23.4	6.302
22	14 18 36.33	2.3337	9 11 58.4	10.313	22	16 10 56.85	2.3396	15 55 38.5	6.200
23	14 20 56.37	2.3342	9 22 15.3	10.249	23	16 13 17.21	2.3391	16 1 47.4	6.097
24	14 23 16.43	2.3346	S. 9 32 28.3	10.183	24	16 15 37.54	2.3386	S. 16 7 50.2	5.995

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 15 37.54	2.3386	S. 16 7 50.2	5.995
1	16 17 57.84	2.3380	16 13 46.8	5.892
2	16 20 18.10	2.3374	16 19 37.3	5.790
3	16 22 38.33	2.3368	16 25 21.6	5.687
4	16 24 58.52	2.3361	16 30 59.7	5.583
5	16 27 18.66	2.3353	16 36 31.5	5.478
6	16 29 38.76	2.3346	16 41 57.1	5.374
7	16 31 58.81	2.3338	16 47 16.4	5.269
8	16 34 18.81	2.3330	16 52 29.4	5.164
9	16 36 38.77	2.3322	16 57 36.1	5.058
10	16 38 58.67	2.3312	17 2 36.4	4.953
11	16 41 18.51	2.3302	17 7 30.4	4.848
12	16 43 38.29	2.3292	17 12 18.1	4.742
13	16 45 58.01	2.3282	17 16 59.4	4.635
14	16 48 17.67	2.3272	17 21 34.3	4.528
15	16 50 37.27	2.3261	17 26 2.8	4.422
16	16 52 56.80	2.3248	17 30 24.9	4.315
17	16 55 16.25	2.3236	17 34 40.6	4.209
18	16 57 35.63	2.3224	17 38 50.0	4.102
19	16 59 54.94	2.3211	17 42 52.9	3.995
20	17 2 14.17	2.3198	17 46 49.4	3.887
21	17 4 33.32	2.3185	17 50 39.4	3.780
22	17 6 52.39	2.3171	17 54 23.0	3.673
23	17 9 11.37	2.3156	S. 17 58 0.2	3.566

SATURDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 11 30.26	2.3141	S. 18 1 30.9	3.459
1	17 13 49.06	2.3126	18 4 55.2	3.352
2	17 16 7.77	2.3111	18 8 13.1	3.244
3	17 18 26.39	2.3095	18 11 24.5	3.137
4	17 20 44.91	2.3078	18 14 29.5	3.029
5	17 23 3.33	2.3061	18 17 28.0	2.922
6	17 25 21.64	2.3043	18 20 20.1	2.815
7	17 27 39.85	2.3026	18 23 5.8	2.708
8	17 29 57.95	2.3008	18 25 45.1	2.601
9	17 32 15.95	2.2990	18 28 17.9	2.493
10	17 34 33.83	2.2971	18 30 44.3	2.387
11	17 36 51.60	2.2952	18 33 4.3	2.280
12	17 39 9.26	2.2933	18 35 17.9	2.173
13	17 41 26.80	2.2913	18 37 25.1	2.067
14	17 43 44.21	2.2892	18 39 25.9	1.961
15	17 46 1.50	2.2871	18 41 20.4	1.855
16	17 48 18.66	2.2849	18 43 8.5	1.749
17	17 50 35.69	2.2828	18 44 50.3	1.643
18	17 52 52.60	2.2806	18 46 25.7	1.537
19	17 55 9.37	2.2784	18 47 54.8	1.432
20	17 57 26.01	2.2762	18 49 17.6	1.327
21	17 59 42.51	2.2738	18 50 34.1	1.222
22	18 1 58.87	2.2715	18 51 44.3	1.118
23	18 4 15.09	2.2691	18 52 48.3	1.014
24	18 6 31.16	2.2667	S. 18 53 46.0	0.910

SUNDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 6 31.16	2.2667	S. 18 53 46.0	0.910
1	18 8 47.09	2.2643	18 54 37.5	0.807
2	18 11 2.87	2.2618	18 55 22.8	0.703
3	18 13 18.51	2.2594	18 56 1.8	0.599
4	18 15 34.00	2.2568	18 56 34.7	0.496
5	18 17 49.33	2.2542	18 57 1.4	0.393
6	18 20 4.50	2.2515	18 57 21.9	0.291
7	18 22 19.51	2.2489	18 57 36.3	0.189
8	18 24 34.37	2.2463	18 57 44.6	− 0.086
9	18 26 49.07	2.2436	18 57 46.9	+ 0.013
10	18 29 3.61	2.2409	18 57 43.1	0.114
11	18 31 17.98	2.2382	18 57 33.2	0.215
12	18 33 32.19	2.2354	18 57 17.3	0.315
13	18 35 46.23	2.2326	18 56 55.4	0.414
14	18 38 0.10	2.2297	18 56 27.6	0.513
15	18 40 13.80	2.2269	18 55 53.8	0.612
16	18 42 27.33	2.2240	18 55 14.1	0.711
17	18 44 40.68	2.2211	18 54 28.5	0.809
18	18 46 53.86	2.2182	18 53 37.0	0.906
19	18 49 6.86	2.2152	18 52 39.7	1.003
20	18 51 19.69	2.2123	18 51 36.6	1.100
21	18 53 32.34	2.2093	18 50 27.7	1.197
22	18 55 44.81	2.2063	18 49 13.0	1.293
23	18 57 57.10	2.2032	S. 18 47 52.5	1.389

MONDAY, NOVEMBER 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 0 9.20	2.2002	S. 18 46 26.3	1.483

PHASES OF THE MOON.

		d	h	m
☽ First Quarter	Oct.	4	10	33.4
○ Full Moon		12	15	23.9
☾ Last Quarter		20	2	40.8
● New Moon		26	19	15.4

		d	h
☾ Apogee	Oct.	8	13.4
☾ Perigee		24	11.8

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Sun	W.	48° 53′ 9″	2779	50° 28′ 5″	2798	52° 2′ 35″	2818	53° 36′ 39″	2838
	α Aquilæ	E.	64 14 49	3048	62 45 36	3086	61 17 9	3125	59 49 30	3166
	Fomalhaut	E.	96 50 15	2763	95 14 58	2779	93 40 3	2797	92 5 31	2815
2	Sun	W.	61 20 35	2937	62 52 7	2957	64 23 14	2976	65 53 57	2995
	α Aquilæ	E.	52 44 18	3406	51 22 8	3463	50 1 2	3523	48 41 3	3587
	Fomalhaut	E.	84 18 50	2911	82 46 45	2931	81 15 6	2952	79 43 53	2973
	α Pegasi	E.	99 1 41	2891	97 29 11	2907	95 57 1	2923	94 25 11	2939
3	Sun	W.	73 21 39	3087	74 50 4	3105	76 18 7	3122	77 45 50	3139
	Mars	W.	25 40 13	3108	27 8 13	3113	28 36 7	3119	30 3 53	3128
	α Aquilæ	E.	42 19 59	3983	41 8 3	4083	39 57 45	4193	38 49 12	4311
	Fomalhaut	E.	72 14 30	3083	70 46 0	3106	69 17 58	3130	67 50 25	3153
	α Pegasi	E.	86 51 21	3026	85 21 40	3043	83 52 20	3060	82 23 22	3078
4	Sun	W.	84 59 24	3219	86 25 11	3234	87 50 40	3248	89 15 52	3262
	Mars	W.	37 20 4	3175	38 46 43	3186	40 13 9	3196	41 39 23	3206
	Antares	W.	29 23 43	3119	30 51 30	3110	32 19 28	3103	33 47 34	3098
	Fomalhaut	E.	60 39 59	3282	59 15 26	3308	57 51 24	3337	56 27 55	3366
	α Pegasi	E.	75 4 2	3169	73 37 16	3188	72 10 52	3206	70 44 50	3225
5	Sun	W.	96 18 2	3324	97 41 46	3336	99 5 16	3346	100 28 34	3357
	Mars	W.	48 47 32	3256	50 12 35	3265	51 37 28	3274	53 2 10	3282
	Antares	W.	41 8 51	3096	42 37 5	3098	44 5 17	3101	45 33 26	3104
	Fomalhaut	E.	49 39 17	3532	48 19 28	3570	47 0 21	3610	45 41 58	3653
	α Pegasi	E.	63 40 20	3323	62 16 35	3344	60 53 14	3365	59 30 17	3386
6	Sun	W.	107 22 20	3400	108 44 36	3408	110 6 44	3415	111 28 44	3421
	Mars	W.	60 3 22	3319	61 27 11	3325	62 50 53	3331	64 14 29	3336
	Antares	W.	52 53 18	3118	54 21 6	3121	55 48 50	3124	57 16 31	3127
	Fomalhaut	E.	39 22 40	3924	38 9 45	3993	36 57 59	4070	35 47 28	4154
	α Pegasi	E.	52 41 58	3507	51 21 42	3535	50 1 56	3563	48 42 41	3593
	α Arietis	E.	94 54 6	3159	93 27 8	3166	92 0 18	3172	90 33 35	3177
7	Sun	W.	118 17 6	3446	119 38 30	3450	120 59 50	3454	122 21 6	3456
	Mars	W.	71 11 5	3358	72 34 10	3360	73 57 12	3363	75 20 11	3365
	Antares	W.	64 34 10	3137	66 1 35	3138	67 28 59	3139	68 56 21	3140
	α Pegasi	E.	42 15 28	3782	41 0 7	3829	39 45 35	3881	38 31 56	3939
	α Arietis	E.	83 21 33	3201	81 55 25	3206	80 29 23	3209	79 3 25	3214
8	Sun	W.	129 6 46	3465	130 27 49	3466	131 48 51	3466	133 9 53	3466
	Mars	W.	82 14 37	3371	83 37 27	3371	85 0 17	3370	86 23 8	3369
	Antares	W.	76 13 2	3140	77 40 23	3139	79 7 45	3138	80 35 8	3138
	α Aquilæ	W.	36 19 36	4759	37 19 46	4646	38 21 31	4546	39 24 43	4453
	α Arietis	E.	71 54 37	3230	70 29 3	3232	69 3 32	3235	67 38 4	3238
	Aldebaran	E.	103 59 55	3073	102 31 13	3073	101 2 31	3073	99 33 49	3073
9	Mars	W.	93 17 42	3360	94 40 44	3358	96 3 49	3356	97 26 56	3353
	Antares	W.	87 52 30	3128	89 20 6	3125	90 47 45	3122	92 15 28	3119
	α Aquilæ	W.	44 59 9	4105	46 9 6	4051	47 19 55	4002	48 31 33	3955
	α Arietis	E.	60 31 36	3253	59 6 29	3256	57 41 26	3259	56 16 27	3263
	Aldebaran	E.	92 9 58	3065	90 41 5	3062	89 12 9	3059	87 43 9	3056

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	**Sun**	W.	55° 10′ 17″	2859	56° 43′ 29″	2878	58° 16′ 16″	2898	59° 48′ 38″	2917
	α Aquilæ	E.	58 22 40	3209	56 56 42	3254	55 31 37	3302	54 7 28	3353
	Fomalhaut	E.	90 31 22	2833	88 57 37	2852	87 24 16	2871	85 51 20	2891
2	**Sun**	W.	67 24 16	3014	68 54 11	3033	70 23 43	3052	71 52 52	3069
	α Aquilæ	E.	47 22 14	3655	46 4 39	3728	44 48 22	3807	43 33 27	3892
	Fomalhaut	E.	78 13 6	2994	76 42 46	3016	75 12 53	3039	73 43 28	3060
	α Pegasi	E.	92 53 42	2957	91 22 35	2973	89 51 49	2990	88 21 24	3008
3	**Sun**	W.	79 13 12	3156	80 40 14	3173	82 6 56	3188	83 33 19	3204
	Mars	W.	31 31 29	3136	32 58 55	3145	34 26 10	3155	35 53 13	3165
	α Aquilæ	E.	37 42 30	4443	36 37 47	4587	35 35 11	4747	34 34 51	4925
	Fomalhaut	E.	66 23 20	3178	64 56 44	3203	63 30 38	3229	62 5 3	3255
	α Pegasi	E.	80 54 46	3096	79 26 32	3114	77 58 40	3133	76 31 10	3151
4	**Sun**	W.	90 40 48	3275	92 5 29	3288	93 29 54	3300	94 54 5	3313
	Mars	W.	43 5 25	3916	44 31 15	3926	45 56 53	3937	47 22 18	3947
	Antares	W.	35 15 46	3096	36 44 1	3094	38 12 18	3094	39 40 35	3095
	Fomalhaut	E.	55 5 0	3396	53 42 39	3428	52 20 54	3461	50 59 46	3496
	α Pegasi	E.	69 19 10	3244	67 53 53	3264	66 28 59	3283	65 4 28	3303
5	**Sun**	W.	101 51 40	3366	103 14 35	3375	104 37 20	3384	105 59 55	3393
	Mars	W.	54 26 42	3290	55 51 5	3298	57 15 19	3305	58 39 25	3313
	Antares	W.	47 1 31	3106	48 29 33	3109	49 57 32	3112	51 25 27	3115
	Fomalhaut	E.	44 24 21	3700	43 7 34	3749	41 51 39	3803	40 36 40	3860
	α Pegasi	E.	58 7 45	3408	56 45 38	3431	55 23 57	3455	54 2 43	3481
6	**Sun**	W.	112 50 37	3427	114 12 23	3432	115 34 3	3438	116 55 37	3442
	Mars	W.	65 37 59	3341	67 1 23	3345	68 24 42	3350	69 47 56	3354
	Antares	W.	58 44 8	3129	60 11 42	3131	61 39 14	3133	63 6 43	3135
	Fomalhaut	E.	34 38 18	4248	33 30 37	4352	32 24 32	4469	31 20 13	4602
	α Pegasi	E.	47 23 59	3626	46 5 53	3661	44 48 24	3698	43 31 35	3738
	α Arietis	E.	89 6 58	3183	87 40 28	3188	86 14 4	3193	84 47 46	3197
7	**Sun**	W.	123 42 19	3459	125 3 29	3462	126 24 36	3463	127 45 42	3464
	Mars	W.	76 43 7	3367	78 6 1	3368	79 28 54	3369	80 51 46	3370
	Antares	W.	70 23 42	3141	71 51 2	3141	73 18 22	3141	74 45 42	3141
	α Pegasi	E.	37 19 16	4003	36 7 39	4073	34 57 11	4152	33 47 59	4240
	α Arietis	E.	77 37 32	3217	76 11 43	3220	74 45 57	3223	73 20 15	3226
8	**Sun**	W.	134 30 55	3466	135 51 57	3465	137 13 0	3464	138 34 4	3463
	Mars	W.	87 46 0	3368	89 8 53	3367	90 31 47	3365	91 54 43	3363
	Antares	W.	82 2 32	3136	83 29 58	3134	84 57 26	3132	86 24 57	3130
	α Aquilæ	W.	40 29 17	4369	41 35 6	4294	42 42 4	4224	43 50 7	4162
	α Arietis	E.	66 12 40	3241	64 47 19	3243	63 22 1	3247	61 56 47	3249
	Aldebaran	E.	98 5 6	3072	96 36 22	3070	95 7 36	3069	93 38 48	3067
9	**Mars**	W.	98 50 6	3350	100 13 20	3345	101 36 39	3342	103 0 2	3338
	Antares	W.	93 43 14	3116	95 11 4	3113	96 38 58	3109	98 6 57	3105
	α Aquilæ	W.	49 43 57	3714	50 57 3	3674	52 10 49	3638	53 25 12	3604
	α Arietis	E.	54 51 32	3267	53 26 42	3272	52 1 58	3278	50 37 21	3284
	Aldebaran	E.	86 14 5	3052	84 44 57	3049	83 15 45	3045	81 46 28	3042

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
10	Antares	W.	99° 35′ 0″	3101	101° 3′ 8″	3098	102° 31′ 20″	3094	103° 59′ 37″	3090
	α Aquilæ	W.	54 40 10	3771	55 55 42	3742	57 11 45	3713	58 28 18	3687
	α Arietis	E.	49 12 51	3291	47 48 29	3298	46 24 15	3306	45 0 11	3317
	Aldebaran	E.	80 17 7	3037	78 47 40	3032	77 18 7	3027	75 48 28	3022
11	α Aquilæ	W.	64 57 38	3574	66 16 41	3555	67 36 5	3537	68 55 48	3520
	α Arietis	E.	38 3 24	3394	36 41 1	3417	35 19 4	3444	33 57 37	3475
	Aldebaran	E.	68 18 37	2995	66 48 18	2989	65 17 52	2983	63 47 18	2977
12	α Aquilæ	W.	75 38 56	3444	77 0 23	3431	78 22 4	3419	79 43 59	3407
	Fomalhaut	W.	42 34 49	3671	43 52 7	3624	45 10 15	3582	46 29 9	3542
	α Pegasi	W.	29 46 39	4405	30 51 56	4271	31 59 15	4155	33 8 24	4050
	Aldebaran	E.	56 12 26	2943	54 41 2	2937	53 9 30	2930	51 37 49	2923
	Pollux	E.	100 2 14	3016	98 32 21	3009	97 2 19	3001	95 32 8	2993
	Saturn	E.	100 9 1	2965	98 38 5	2958	97 7 0	2951	95 35 46	2944
13	α Aquilæ	W.	86 36 42	3358	87 59 47	3349	89 23 2	3340	90 46 27	3333
	Fomalhaut	W.	53 13 39	3382	54 36 16	3356	55 59 23	3331	57 22 59	3307
	α Pegasi	W.	39 16 39	3671	40 33 57	3615	41 52 15	3565	43 11 28	3517
	Aldebaran	E.	43 57 6	2886	42 24 29	2879	40 51 43	2871	39 18 47	2863
	Saturn	E.	87 57 18	2907	86 25 8	2899	84 52 48	2891	83 20 18	2884
	Pollux	E.	87 58 50	2957	86 27 43	2949	84 56 26	2942	83 25 0	2935
14	Fomalhaut	W.	64 27 19	3208	65 53 19	3190	67 19 40	3173	68 46 21	3156
	α Pegasi	W.	49 59 16	3333	51 22 49	3304	52 46 56	3276	54 11 36	3249
	Aldebaran	E.	31 31 39	2825	29 57 43	2817	28 23 37	2809	26 49 21	2801
	Saturn	E.	75 35 22	2845	74 1 52	2837	72 28 12	2829	70 54 22	2822
	Pollux	E.	75 45 38	2900	74 13 19	2893	72 40 51	2887	71 8 15	2880
	Regulus	E.	111 38 38	2825	110 4 43	2818	108 30 38	2810	106 56 23	2801
15	Fomalhaut	W.	76 4 12	3088	77 32 36	3076	79 1 15	3065	80 30 8	3054
	α Pegasi	W.	61 22 5	3139	62 49 27	3120	64 17 12	3102	65 45 19	3086
	Saturn	E.	63 2 39	2782	61 27 47	2773	59 52 44	2765	58 17 30	2757
	Pollux	E.	63 23 12	2850	61 49 49	2844	60 16 18	2838	58 42 40	2834
	Regulus	E.	99 2 28	2761	97 27 9	2753	95 51 39	2744	94 15 58	2737
16	Fomalhaut	W.	87 57 52	3002	89 28 2	2994	90 58 22	2985	92 28 53	2977
	α Pegasi	W.	73 10 50	3009	74 40 51	2996	76 11 9	2983	77 41 43	2970
	α Arietis	W.	29 57 4	3282	31 21 36	3221	32 47 20	3168	34 14 8	3119
	Saturn	E.	50 18 42	2716	48 42 24	2708	47 5 55	2700	45 29 15	2692
	Pollux	E.	50 53 0	2813	49 18 49	2811	47 44 35	2808	46 10 18	2806
	Regulus	E.	86 14 48	2694	84 38 0	2685	83 1 0	2677	81 23 49	2668
17	Fomalhaut	W.	100 3 49	2943	101 35 13	2938	103 6 44	2933	104 38 21	2929
	α Arietis	W.	41 41 2	2939	43 12 32	2911	44 44 37	2885	46 17 15	2860
	Saturn	E.	37 23 15	2652	35 45 31	2645	34 7 37	2638	32 29 33	2629
	Pollux	E.	38 18 51	2815	36 44 43	2821	35 10 43	2830	33 36 54	2842
	Regulus	E.	73 14 52	2623	71 36 28	2614	69 57 52	2604	68 19 3	2595
	Sun	E.	128 45 11	2978	127 14 31	2968	125 43 38	2958	124 12 32	2947
18	α Arietis	W.	54 7 47	2756	55 43 12	2738	57 19 1	2721	58 55 13	2704
	Aldebaran	W.	20 6 14	2547	21 46 22	2537	23 26 44	2527	25 7 20	2517

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
10	Antares	W.	105° 27′ 59″	3086	106° 56′ 26″	3082	108° 24′ 58″	3077	109° 53′ 36″	3073
	α Aquilæ	W.	59 45 19	3662	61 2 47	3638	62 20 40	3616	63 38 57	3594
	α Arietis	E.	43 36 19	3328	42 12 40	3341	40 49 16	3357	39 26 10	3374
	Aldebaran	E.	74 18 43	3018	72 48 52	3012	71 18 54	3006	69 48 49	3001
11	α Aquilæ	W.	70 15 50	3504	71 36 10	3488	72 56 48	3471	74 17 44	3457
	α Arietis	E.	32 36 45	3513	31 16 35	3555	29 57 12	3605	28 38 43	3664
	Aldebaran	E.	62 16 36	2970	60 45 46	2964	59 14 48	2957	57 43 41	2950
12	α Aquilæ	W.	81 6 8	3396	82 28 29	3386	83 51 2	3375	85 13 47	3366
	Fomalhaut	W.	47 48 47	3505	49 9 6	3471	50 30 2	3439	51 51 34	3410
	α Pegasi	W.	34 19 14	3956	35 31 37	3874	36 45 23	3799	38 0 26	3732
	Aldebaran	E.	50 5 59	2916	48 34 0	2908	47 1 51	2901	45 29 33	2894
	Pollux	E.	94 1 47	2986	92 31 17	2978	91 0 37	2971	89 29 48	2964
	Saturn	E.	94 4 23	2937	92 32 51	2929	91 1 9	2923	89 29 18	2915
13	α Aquilæ	W.	92 10 0	3327	93 33 40	3321	94 57 27	3316	96 21 20	3311
	Fomalhaut	W.	58 47 2	3285	60 11 31	3265	61 36 24	3245	63 1 40	3225
	α Pegasi	W.	44 31 33	3475	45 52 25	3436	47 14 1	3399	48 36 19	3365
	Aldebaran	E.	37 45 41	2855	36 12 25	2848	34 39 0	2841	33 5 25	2832
	Saturn	E.	81 47 39	2876	80 14 50	2869	78 41 51	2861	77 8 42	2852
	Pollux	E.	81 53 26	2928	80 21 43	2921	78 49 51	2913	77 17 49	2906
14	Fomalhaut	W.	70 13 20	3143	71 40 37	3129	73 8 12	3114	74 36 4	3101
	α Pegasi	W.	55 36 47	3225	57 2 27	3202	58 28 34	3180	59 55 7	3159
	Aldebaran	E.	25 14 54	2793	23 40 17	2785	22 5 30	2777	20 30 32	2769
	Saturn	E.	69 20 23	2814	67 46 13	2805	66 11 52	2798	64 37 21	2789
	Pollux	E.	69 35 31	2873	68 2 38	2867	66 29 37	2861	64 56 28	2855
	Regulus	E.	105 21 57	2794	103 47 21	2785	102 12 34	2777	100 37 36	2769
15	Fomalhaut	W.	81 59 14	3043	83 28 34	3031	84 58 8	3022	86 27 54	3012
	α Pegasi	W.	67 13 46	3069	68 42 33	3053	70 11 40	3038	71 41 6	3023
	Saturn	E.	56 42 6	2749	55 6 31	2741	53 30 45	2733	51 54 49	2725
	Pollux	E.	57 8 56	2829	55 35 6	2824	54 1 9	2820	52 27 7	2816
	Regulus	E.	92 40 7	2729	91 4 5	2719	89 27 51	2710	87 51 25	2702
16	Fomalhaut	W.	93 59 34	2969	95 30 25	2962	97 1 25	2956	98 32 33	2950
	α Pegasi	W.	79 12 33	2958	80 43 38	2946	82 14 58	2935	83 46 32	2925
	α Arietis	W.	35 41 54	3077	37 10 32	3037	38 39 59	3001	40 10 10	2969
	Saturn	E.	43 52 25	2684	42 15 24	2676	40 38 12	2668	39 0 49	2660
	Pollux	E.	44 36 0	2807	43 1 41	2807	41 27 22	2808	39 53 5	2811
	Regulus	E.	79 46 26	2659	78 8 51	2650	76 31 4	2640	74 53 4	2632
17	Fomalhaut	W.	106 10 3	2925	107 41 50	2921	109 13 42	2919	110 45 37	2917
	α Arietis	W.	47 50 25	2838	49 24 4	2815	50 58 12	2795	52 32 47	2775
	Saturn	E.	30 51 18	2622	29 12 53	2616	27 34 20	2610	25 55 39	2605
	Pollux	E.	32 3 21	2856	30 30 6	2874	28 57 14	2898	27 24 52	2928
	Regulus	E.	66 40 1	2585	65 0 46	2576	63 21 18	2566	61 41 37	2557
	Sun	E.	122 41 13	2936	121 9 40	2926	119 37 54	2915	118 5 54	2905
18	α Arietis	W.	60 31 47	2688	62 8 43	2672	63 46 0	2657	65 23 37	2643
	Aldebaran	W.	26 48 10	2507	28 29 14	2497	30 10 32	2486	31 52 5	2476

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh	P. L. of Diff.	IXh.	P. L. of Diff.
18	Regulus	E.	60° 1′ 43″	2547	58° 21′ 35″	2536	56° 41′ 14″	2527	55° 0′ 39″	2518
	Sun	E.	116 33 41	2894	115 1 14	2883	113 28 33	2872	111 55 38	2862
19	α Arietis	W.	67 1 34	2628	68 39 51	2614	70 18 27	2601	71 57 21	2587
	Aldebaran	W.	33 33 52	2465	35 15 54	2455	36 58 10	2445	38 40 41	2435
	Regulus	E.	46 34 16	2467	44 52 17	2457	43 10 3	2447	41 27 35	2436
	Sun	E.	104 7 34	2806	102 33 14	2795	100 58 39	2784	99 23 50	2772
20	α Arietis	W.	80 16 22	2524	81 57 2	2512	83 37 58	2501	85 19 10	2489
	Aldebaran	W.	47 16 58	2382	49 0 58	2371	50 45 14	2361	52 29 45	2350
	Regulus	E.	32 51 33	2385	31 7 37	2375	29 23 26	2364	27 39 0	2355
	Sun	E.	91 26 1	2716	89 49 43	2704	88 13 9	2693	86 36 20	2683
21	α Arietis	W.	93 48 56	2438	95 31 36	2429	97 14 29	2421	98 57 34	2412
	Aldebaran	W.	61 16 6	2299	63 2 7	2289	64 48 23	2279	66 34 53	2270
	Saturn	W.	17 18 19	2380	19 2 23	2357	20 46 59	2338	22 32 3	2321
	Sun	E.	78 28 36	2629	76 50 20	2618	75 11 49	2607	73 33 4	2597
22	α Arietis	W.	107 35 46	2378	109 19 52	2373	111 4 6	2368	112 48 26	2364
	Aldebaran	W.	75 30 54	2223	77 18 47	2215	79 6 52	2206	80 55 10	2198
	Pollux	W.	32 58 15	2457	34 40 29	2428	36 23 24	2403	38 6 55	2380
	Saturn	W.	31 22 55	2255	33 10 1	2244	34 57 23	2233	36 45 1	2224
	Sun	E.	65 15 56	2550	63 35 52	2541	61 55 36	2533	60 15 8	2525
23	Aldebaran	W.	89 59 32	2163	91 48 56	2157	93 38 29	2152	95 28 9	2147
	Pollux	W.	46 51 54	2291	48 38 6	2279	50 24 37	2267	52 11 25	2257
	Saturn	W.	45 46 33	2182	47 35 27	2176	49 24 31	2169	51 13 45	2163
	Sun	E.	51 50 13	2491	50 8 47	2485	48 27 13	2480	46 45 32	2477
24	Aldebaran	W.	104 38 18	2127	106 28 36	2124	108 18 58	2122	110 9 23	2121
	Pollux	W.	61 8 56	2216	62 57 0	2211	64 45 11	2206	66 33 29	2203
	Saturn	W.	60 21 54	2141	62 11 50	2139	64 1 50	2136	65 51 54	2135
	Sun	E.	38 15 59	2465	36 33 57	2466	34 51 56	2467	33 9 57	2470
28	Sun	W.	16 40 12	2787	18 14 57	2779	19 49 52	2777	21 24 50	2780
	α Aquilæ	E.	69 29 54	2880	67 57 9	2909	66 25 1	2939	64 53 31	2970
	Fomalhaut	E.	102 18 17	2645	100 40 23	2655	99 2 43	2666	97 25 18	2679
29	Sun	W.	29 17 38	2827	30 51 31	2841	32 25 6	2855	33 58 23	2869
	α Aquilæ	E.	57 26 50	3163	55 59 57	3209	54 33 58	3258	53 8 57	3310
	Fomalhaut	E.	89 22 47	2753	87 47 18	2771	86 12 12	2788	84 37 29	2806
	α Pegasi	E.	104 12 27	2756	102 37 1	2769	101 1 52	2782	99 27 0	2795
30	Sun	W.	41 39 52	2950	43 11 8	2967	44 42 2	2984	46 12 35	3001
	α Aquilæ	E.	46 20 18	3633	45 2 19	3712	43 45 45	3800	42 30 43	3894
	Fomalhaut	E.	76 50 4	2908	75 17 55	2929	73 46 13	2952	72 15 0	2974
	α Pegasi	E.	91 37 25	2873	90 4 32	2890	88 32 0	2907	86 59 50	2925
31	Sun	W.	53 40 0	3087	55 8 26	3103	56 36 32	3120	58 4 17	3137
	Antares	W.	25 3 32	3060	26 32 30	3040	28 1 53	3026	29 31 34	3015
	Fomalhaut	E.	64 46 20	3100	63 18 10	3127	61 50 33	3154	60 23 29	3183
	α Pegasi	E.	79 24 48	3019	77 54 59	3039	76 25 35	3060	74 56 36	3079

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
18	Regulus	E.	53° 19′ 51″	2508	51° 38′ 49″	2497	49° 57′ 32″	2487	48° 16′ 1″	2477
	Sun	E.	110 22 30	2851	108 49 8	2839	107 15 31	2828	105 41 40	2817
19	α Arietis	W.	73 36 34	2574	75 16 5	2561	76 55 53	2548	78 35 59	2536
	Aldebaran	W.	40 23 26	2424	42 6 27	2413	43 49 43	2403	45 33 13	2393
	Regulus	E.	39 44 52	2426	38 1 54	2416	36 18 42	2405	34 35 15	2395
	Sun	E.	97 48 46	2761	96 13 27	2750	94 37 53	2738	93 2 4	2728
20	α Arietis	W.	87 0 38	2479	88 42 21	2469	90 24 18	2458	92 6 30	2448
	Aldebaran	W.	54 14 31	2340	55 59 32	2330	57 44 48	2320	59 30 19	2309
	Regulus	E.	25 54 20	2345	24 9 26	2335	22 24 18	2326	20 38 56	2316
	Sun	E.	84 59 17	2672	83 21 59	2660	81 44 26	2649	80 6 38	2639
21	α Arietis	W.	100 40 51	2404	102 24 20	2397	104 7 59	2390	105 51 48	2384
	Aldebaran	W.	68 21 37	2260	70 8 35	2251	71 55 47	2241	73 43 14	2232
	Saturn	W.	24 17 32	2306	26 3 23	2291	27 49 35	2279	29 36 6	2266
	Sun	E.	71 54 5	2588	70 14 53	2577	68 35 27	2568	66 55 48	2559
22	α Arietis	W.	114 32 52	2362	116 17 22	2360	118 1 54	2359	119 46 28	2359
	Aldebaran	W.	82 43 40	2190	84 32 22	2183	86 21 15	2176	88 10 18	2169
	Pollux	W.	39 50 59	2359	41 35 33	2339	43 20 35	2322	45 6 3	2306
	Saturn	W.	38 32 53	2214	40 20 59	2206	42 9 18	2197	43 57 50	2190
	Sun	E.	58 34 29	2517	56 53 40	2510	55 12 40	2503	53 31 31	2497
23	Aldebaran	W.	97 17 57	2142	99 7 52	2137	100 57 55	2133	102 48 4	2130
	Pollux	W.	53 58 28	2247	55 45 46	2237	57 33 18	2229	59 21 2	2223
	Saturn	W.	53 3 8	2158	54 52 39	2153	56 42 18	2149	58 32 3	2145
	Sun	E.	45 3 46	2473	43 21 55	2470	41 39 59	2467	39 58 0	2466
24	Aldebaran	W.	111 59 50	2120	113 50 18	2120	115 40 46	2120	117 31 14	2121
	Pollux	W.	68 21 52	2200	70 10 19	2198	71 58 50	2196	73 47 23	2196
	Saturn	W.	67 42 0	2134	69 32 8	2133	71 22 17	2133	73 12 26	2134
	Sun	E.	31 28 1	2473	29 46 10	2478	28 4 26	2485	26 22 52	2494
28	Sun	W.	22 59 44	2786	24 34 30	2794	26 9 6	2804	27 43 29	2815
	α Aquilæ	E.	63 22 41	3004	61 52 33	3040	60 23 10	3079	58 54 35	3120
	Fomalhaut	E.	95 48 10	2692	94 11 20	2707	92 34 49	2722	90 58 38	2737
29	Sun	W.	35 31 21	2884	37 4 0	2901	38 36 18	2917	40 8 15	2933
	α Aquilæ	E.	51 44 57	3366	50 22 2	3425	49 0 14	3489	47 39 38	3558
	Fomalhaut	E.	83 3 9	2825	81 29 14	2845	79 55 45	2865	78 22 41	2886
	α Pegasi	E.	97 52 26	2809	96 18 10	2825	94 44 14	2841	93 10 39	2857
30	Sun	W.	47 42 46	3018	49 12 36	3035	50 42 5	3052	52 11 13	3069
	α Aquilæ	E.	41 17 17	3997	40 5 34	4110	38 55 42	4234	37 47 48	4369
	Fomalhaut	E.	70 44 15	2998	69 14 0	3023	67 44 16	3047	66 15 2	3073
	α Pegasi	E.	85 28 3	2943	83 56 39	2962	82 25 38	2981	80 55 1	3000
31	Sun	W.	59 31 42	3153	60 58 47	3169	62 25 33	3185	63 52 0	3200
	Antares	W.	31 1 28	3008	32 31 31	3004	34 1 39	3002	35 31 49	3002
	Fomalhaut	E.	58 57 0	3214	57 31 7	3244	56 5 50	3276	54 41 10	3309
	α Pegasi	E.	73 28 1	3101	71 59 52	3122	70 32 9	3143	69 4 51	3165

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	14 26 26.88	9.806	S. 14 30 19.4	–48.00	16 9.84	66.96	16 17.54	0.049
Tues.	2	14 30 22.62	9.840	14 49 24.5	47.41	16 10.09	67.08	16 18.35	0.016
Wed.	3	14 34 19.15	9.873	15 8 15.0	46.80	16 10.34	67.20	16 18.37	0.017
Thur.	4	14 38 16.48	9.906	15 26 50.6	–46.17	16 10.59	67.32	16 17.60	0.050
Frid.	5	14 42 14.61	9.939	15 45 10.9	45.52	16 10.84	67.44	16 16.03	0.083
Sat.	6	14 46 13.56	9.973	16 3 15.4	44.85	16 11.08	67.55	16 13.65	0.117
SUN.	7	14 50 13.33	10.007	16 21 3.7	–44.17	16 11.32	67.67	16 10.44	0.151
Mon.	8	14 54 13.93	10.042	16 38 35.5	43.47	16 11.56	67.79	16 6.40	0.186
Tues.	9	14 58 15.36	10.077	16 55 50.3	42.76	16 11.79	67.91	16 1.53	0.221
Wed.	10	15 2 17.63	10.112	17 12 47.9	–42.03	16 12.01	68.02	15 55.84	0.256
Thur.	11	15 6 20.75	10.147	17 29 27.8	41.28	16 12.24	68.14	15 49.30	0.291
Frid.	12	15 10 24.72	10.183	17 45 49.6	40.52	16 12.46	68.26	15 41.90	0.327
Sat.	13	15 14 29.55	10.219	18 1 52.8	–39.74	16 12.67	68.38	15 33.63	0.363
SUN.	14	15 18 35.24	10.255	18 17 37.0	38.94	16 12.88	68.50	15 24.52	0.399
Mon.	15	15 22 41.79	10.291	18 33 1.9	38.13	16 13.09	68.62	15 14.56	0.435
Tues.	16	15 26 49.19	10.326	18 48 7.3	–37.30	16 13.30	68.74	15 3.74	0.470
Wed.	17	15 30 57.46	10.361	19 2 52.6	36.46	16 13.50	68.86	14 52.06	0.505
Thur.	18	15 35 6.58	10.397	19 17 17.6	35.60	16 13.69	68.97	14 39.54	0.540
Frid.	19	15 39 16.54	10.432	19 31 21.9	–34.73	16 13.88	69.09	14 26.17	0.575
Sat.	20	15 43 27.34	10.467	19 45 5.1	33.84	16 14.07	69.20	14 11.96	0.610
SUN.	21	15 47 38.97	10.501	19 58 26.7	32.94	16 14.26	69.31	13 56.92	0.644
Mon.	22	15 51 51.44	10.535	20 11 26.5	–32.02	16 14.44	69.42	13 41.06	0.678
Tues.	23	15 56 4.71	10.568	20 24 4.0	31.09	16 14.62	69.53	13 24.39	0.711
Wed.	24	16 0 18.77	10.601	20 36 18.9	30.14	16 14.80	69.63	13 6.93	0.744
Thur.	25	16 4 33.61	10.634	20 48 10.9	–29.18	16 14.98	69.74	12 48.70	0.776
Frid.	26	16 8 49.20	10.665	20 59 39.7	28.20	16 15.15	69.84	12 29.70	0.807
Sat.	27	16 13 5.52	10.695	21 10 44.9	27.21	16 15.32	69.94	12 9.99	0.837
SUN.	28	16 17 22.55	10.724	21 21 26.1	–26.20	16 15.49	70.04	11 49.58	0.866
Mon.	29	16 21 40.27	10.752	21 31 42.9	25.18	16 15.65	70.14	11 28.47	0.894
Tues.	30	16 25 58.67	10.780	21 41 35.2	24.15	16 15.81	70.23	11 6.69	0.922
Wed.	31	16 30 17.71	10.806	S. 21 51 2.5	–23.11	16 15.97	70.32	10 44.27	0.948

Note.—The mean time of semidiameter passing may be found by subtracting $0^s.19$ from the sidereal time.
The sign – prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Mon.	1	14 26 29.54	9.807	S. 14 30 32.4	–48.00	16 17.55	0.049	14 42 47.09
Tues.	2	14 30 25.29	9.840	14 49 37.3	47.40	16 18.35	0.016	14 46 43.64
Wed.	3	14 34 21.83	9.873	15 8 27.7	46.79	16 18.36	0.017	14 50 40.20
Thur.	4	14 38 19.17	9.906	15 27 3.1	–46.16	16 17.58	0.050	14 54 36.75
Frid.	5	14 42 17.31	9.939	15 45 23.2	45.51	16 16.00	0.083	14 58 33.31
Sat.	6	14 46 16.26	9.973	16 3 27.5	44.84	16 13.61	0.117	15 2 29.86
SUN.	7	14 50 16.03	10.007	16 21 15.6	–44.16	16 10.39	0.151	15 6 26.42
Mon.	8	14 54 16.63	10.042	16 38 47.1	43.46	16 6.34	0.186	15 10 22.97
Tues.	9	14 58 18.06	10.077	16 56 1.7	42.75	16 1.47	0.221	15 14 19.53
Wed.	10	15 2 20.32	10.112	17 12 59.0	–42.02	15 55.77	0.256	15 18 16.08
Thur.	11	15 6 23.43	10.147	17 29 38.6	41.27	15 49.22	0.291	15 22 12.64
Frid.	12	15 10 27.39	10.183	17 46 0.1	40.51	15 41.81	0.327	15 26 9.19
Sat.	13	15 14 32.21	10.219	18 2 3.0	–39.73	15 33.54	0.363	15 30 5.75
SUN.	14	15 18 37.88	10.255	18 17 46.8	38.93	15 24.42	0.399	15 34 2.30
Mon.	15	15 22 44.40	10.291	18 33 11.5	38.12	15 14.45	0.435	15 37 58.86
Tues.	16	15 26 51.78	10.326	18 48 16.6	–37.29	15 3.63	0.470	15 41 55.41
Wed.	17	15 31 0.03	10.361	19 3 1.6	36.45	14 51.94	0.505	15 45 51.97
Thur.	18	15 35 9.12	10.396	19 17 26.3	35.59	14 39.40	0.540	15 49 48.52
Frid.	19	15 39 19.05	10.431	19 31 30.3	–34.72	14 26.03	0.575	15 53 45.08
Sat.	20	15 43 29.82	10.466	19 45 13.1	33.83	14 11.81	0.610	15 57 41.63
SUN.	21	15 47 41.42	10.500	19 58 34.4	32.93	13 56.77	0.644	16 1 38.19
Mon.	22	15 51 53.84	10.534	20 11 33.8	–32.01	13 40.90	0.678	16 5 34.74
Tues.	23	15 56 7.07	10.567	20 24 11.0	31.08	13 24.23	0.711	16 9 31.30
Wed.	24	16 0 21.08	10.600	20 36 25.6	30.13	13 6.77	0.744	16 13 27.85
Thur.	25	16 4 35.87	10.632	20 48 17.2	–29.17	12 48.54	0.776	16 17 24.41
Frid.	26	16 8 51.42	10.663	20 59 45.6	28.19	12 29.54	0.807	16 21 20.96
Sat.	27	16 13 7.69	10.693	21 10 50.4	27.20	12 9.83	0.837	16 25 17.52
SUN.	28	16 17 24.66	10.722	21 21 31.2	–26.19	11 49.41	0.866	16 29 14.07
Mon.	29	16 21 42.33	10.750	21 31 47.6	25.17	11 28.30	0.894	16 33 10.63
Tues.	30	16 26 0.67	10.778	21 41 39.5	24.14	11 6.52	0.922	16 37 7.19
Wed.	31	16 30 19.65	10.804	S. 21 51 6.6	–23.10	10 44.10	0.948	16 41 3.75

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign – prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour, + $9^s.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	305	219 1 14.5	0 41.6	150.28	+ 0.68	9.9964765	- 47.3	9 15 41.63
2	306	220 1 21.9	0 48.9	150.34	0.59	9.9963632	47.0	9 11 45.73
3	307	221 1 30.9	0 57.8	150.40	0.48	9.9962508	46.6	9 7 49.82
4	308	222 1 41.5	1 8.3	150.46	+ 0.35	9.9961394	- 46.2	9 3 53.92
5	309	223 1 53.6	1 20.3	150.53	0.21	9.9960291	45.7	8 59 58.01
6	310	224 2 7.2	1 33.7	150.59	+ 0.07	9.9959201	45.1	8 56 2.10
7	311	225 2 22.3	1 48.7	150.65	− 0.07	9.9958126	- 44.5	8 52 6.18
8	312	226 2 38.9	2 5.2	150.72	0.19	9.9957068	43.8	8 48 10.27
9	313	227 2 57.0	2 23.2	150.78	0.28	9.9956028	43.0	8 44 14.36
10	314	228 3 16.7	2 42.8	150.84	− 0.34	9.9955006	- 42.2	8 40 18.45
11	315	229 3 38.0	3 3.9	150.91	0.38	9.9954003	41.4	8 36 22.54
12	316	230 4 0.9	3 26.7	150.98	0.39	9.9953020	40.6	8 32 26.63
13	317	231 4 25.5	3 51.2	151.05	− 0.37	9.9952057	- 39.8	8 28 30.72
14	318	232 4 51.9	4 17.5	151.13	0.33	9.9951112	39.0	8 24 34.81
15	319	233 5 20.0	4 45.4	151.20	0.26	9.9950187	38.2	8 20 38.90
16	320	234 5 49.9	5 15.1	151.28	− 0.17	9.9949281	- 37.4	8 16 42.99
17	321	235 6 21.7	5 46.8	151.36	− 0.05	9.9948393	36.6	8 12 47.08
18	322	236 6 55.3	6 20.3	151.44	+ 0.08	9.9947523	35.9	8 8 51.17
19	323	237 7 30.6	6 55.5	151.51	+ 0.21	9.9946669	- 35.3	8 4 55.27
20	324	238 8 7.7	7 32.4	151.58	0.34	9.9945829	34.7	8 0 59.36
21	325	239 8 46.5	8 11.0	151.64	0.46	9.9945003	34.1	7 57 3.45
22	326	240 9 26.9	8 51.3	151.70	+ 0.57	9.9944189	- 33.6	7 53 7.54
23	327	241 10 9.0	9 33.3	151.77	0.65	9.9943389	33.0	7 49 11.63
24	328	242 10 52.6	10 16.8	151.84	0.70	9.9942602	32.5	7 45 15.72
25	329	243 11 37.7	11 1.7	151.90	+ 0.72	9.9941827	- 32.0	7 41 19.81
26	330	244 12 24.2	11 48.0	151.96	0.71	9.9941063	31.6	7 37 23.90
27	331	245 13 11.9	12 35.6	152.01	0.68	9.9940310	31.1	7 33 27.99
28	332	246 14 0.8	13 24.4	152.06	+ 0.62	9.9939569	- 30.6	7 29 32.08
29	333	247 14 50.7	14 14.1	152.10	0.53	9.9938842	30.0	7 25 36.17
30	334	248 15 41.6	15 4.8	152.14	0.41	9.9938129	29.4	7 21 40.26
31	335	249 16 33.5	15 56.5	152.18	+ 0.28	9.9937430	- 28.8	7 17 44.35

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January $0^{d}.0$.

Diff. for 1 Hour,
— $9^{s}.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 12.9	15 7.5	55 43.5	−1.72	55 23.8	−1.56	4 26.4	2.09	5.2
2	15 2.7	14 58.5	55 6.2	1.38	54 50.8	1.18	5 15.6	2.00	6.2
3	14 55.0	14 52.2	54 37.9	0.97	54 27.6	0.75	6 2.7	1.92	7.2
4	14 50.1	14 48.7	54 19.8	−0.54	54 14.6	−0.32	6 48.0	1.85	8.2
5	14 48.0	14 48.0	54 12.1	−0.11	54 12.0	+0.09	7 31.9	1.80	9.2
6	14 48.6	14 49.8	54 14.3	+0.28	54 18.8	0.47	8 14.8	1.78	10.2
7	14 51.7	14 54.0	54 25.5	+0.64	54 34.1	+0.79	8 57.6	1.79	11.2
8	14 56.8	15 0.0	54 44.4	0.93	54 56.3	1.04	9 40.8	1.82	12.2
9	15 3.6	15 7.5	55 9.4	1.13	55 23.5	1.21	10 25.0	1.88	13.2
10	15 11.5	15 15.7	55 38.3	+1.26	55 53.8	+1.30	11 11.0	1.96	14.2
11	15 20.0	15 24.3	56 9.5	1.31	56 25.2	1.31	11 59.3	2.06	15.2
12	15 28.5	15 32.7	56 40.9	1.30	56 56.3	1.26	12 50.0	2.17	16.2
13	15 36.8	15 40.7	57 11.2	+1.22	57 25.6	+1.17	13 43.2	2.26	17.2
14	15 44.4	15 48.0	57 39.3	1.11	57 52.3	1.06	14 38.1	2.32	18.2
15	15 51.3	15 54.5	58 4.6	1.00	58 16.2	0.93	15 34.1	2.34	19.2
16	15 57.4	16 0.2	58 27.0	+0.87	58 37.1	+0.81	16 30.1	2.32	20.2
17	16 2.7	16 5.0	58 46.4	0.74	58 54.9	0.67	17 25.2	2.27	21.2
18	16 7.1	16 8.9	59 2.5	0.60	59 9.3	0.53	18 19.2	2.22	22.2
19	16 10.5	16 11.8	59 15.1	+0.43	59 19.7	+0.33	19 12.1	2.18	23.2
20	16 12.7	16 13.2	59 23.0	+0.22	59 24.9	+0.09	20 4.2	2.16	24.2
21	16 13.2	16 12.8	59 25.1	−0.06	59 23.5	−0.21	20 56.0	2.16	25.2
22	16 11.8	16 10.3	59 20.0	−0.38	59 14.4	−0.56	21 48.1	2.18	26.2
23	16 8.2	16 5.5	59 6.6	0.74	58 56.6	0.93	22 40.9	2.22	27.2
24	16 2.2	15 58.3	58 44.4	1.10	58 30.2	1.26	23 34.5	2.25	28.2
25	15 53.9	15 49.1	58 14.2	−1.40	57 56.6	−1.53	☌		29.2
26	15 44.0	15 38.5	57 37.6	1.62	57 17.7	1.68	0 28.5	2.25	0.7
27	15 33.0	15 27.4	56 57.3	1.71	56 36.6	1.71	1 22.4	2.23	1.7
28	15 21.8	15 16.4	56 16.2	−1.68	55 56.3	−1.61	2 15.2	2.17	2.7
29	15 11.3	15 6.5	55 37.5	1.52	55 19.9	1.40	3 6.2	2.08	3.7
30	15 2.1	14 58.3	55 3.9	1.25	54 49.9	1.08	3 55.1	1.99	4.7
31	14 55.0	14 52.4	54 37.9	−0.90	54 28.3	−0.70	4 41.8	1.90	5.7

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 1.					**WEDNESDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 0 9.20	2.2002	S. 18 46 26.3	1.483	0	20 42 4.11	2.0463	S. 15 55 32.4	5.430
1	19 2 21.12	2.1971	18 44 54.5	1.577	1	20 44 6.80	2.0432	15 50 4.5	5.499
2	19 4 32.85	2.1940	18 43 17.0	1.671	2	20 46 9.30	2.0401	15 44 32.5	5.567
3	19 6 44.40	2.1909	18 41 33.9	1.765	3	20 48 11.61	2.0370	15 38 56.4	5.635
4	19 8 55.76	2.1878	18 39 45.2	1.858	4	20 50 13.74	2.0341	15 33 16.3	5.702
5	19 11 6.94	2.1847	18 37 50.9	1.951	5	20 52 15.70	2.0312	15 27 32.2	5.768
6	19 13 17.93	2.1816	18 35 51.1	2.043	6	20 54 17.48	2.0282	15 21 44.1	5.834
7	19 15 28.73	2.1784	18 33 45.8	2.134	7	20 56 19.08	2.0252	15 15 52.1	5.900
8	19 17 39.34	2.1752	18 31 35.0	2.226	8	20 58 20.51	2.0223	15 9 56.1	5.966
9	19 19 49.75	2.1720	18 29 18.7	2.317	9	21 0 21.76	2.0194	15 3 56.2	6.030
10	19 21 59.98	2.1688	18 26 57.0	2.407	10	21 2 22.84	2.0165	14 57 52.5	6.093
11	19 24 10.01	2.1656	18 24 29.9	2.496	11	21 4 23.74	2.0136	14 51 45.1	6.155
12	19 26 19.85	2.1623	18 21 57.5	2.584	12	21 6 24.47	2.0108	14 45 33.9	6.218
13	19 28 29.49	2.1591	18 19 19.8	2.673	13	21 8 25.03	2.0080	14 39 18.9	6.281
14	19 30 38.94	2.1559	18 16 36.7	2.762	14	21 10 25.43	2.0052	14 33 0.2	6.343
15	19 32 48.20	2.1527	18 13 48.3	2.850	15	21 12 25.66	2.0024	14 26 37.8	6.403
16	19 34 57.26	2.1494	18 10 54.7	2.936	16	21 14 25.72	1.9997	14 20 11.8	6.463
17	19 37 6.13	2.1462	18 7 56.0	3.022	17	21 16 25.62	1.9970	14 13 42.2	6.524
18	19 39 14.80	2.1429	18 4 52.1	3.108	18	21 18 25.36	1.9943	14 7 8.9	6.584
19	19 41 23.28	2.1397	18 1 43.0	3.194	19	21 20 24.94	1.9917	14 0 32.1	6.643
20	19 43 31.56	2.1363	17 58 28.8	3.278	20	21 22 24.36	1.9890	13 53 51.8	6.701
21	19 45 39.64	2.1330	17 55 9.6	3.363	21	21 24 23.62	1.9864	13 47 8.0	6.758
22	19 47 47.52	2.1297	17 51 45.3	3.447	22	21 26 22.73	1.9838	13 40 20.8	6.815
23	19 49 55.21	2.1265	S. 17 48 16.0	3.529	23	21 28 21.68	1.9812	S. 13 33 30.2	6.872
	TUESDAY 2.					**THURSDAY 4.**			
0	19 52 2.70	2.1232	S. 17 44 41.8	3.612	0	21 30 20.48	1.9787	S. 13 26 36.2	6.928
1	19 54 9.99	2.1199	17 41 2.6	3.694	1	21 32 19.13	1.9762	13 19 38.9	6.983
2	19 56 17.09	2.1167	17 37 18.5	3.776	2	21 34 17.63	1.9737	13 12 38.2	7.039
3	19 58 23.99	2.1134	17 33 29.5	3.858	3	21 36 15.98	1.9713	13 5 34.2	7.093
4	20 0 30.70	2.1101	17 29 35.6	3.938	4	21 38 14.19	1.9690	12 58 27.0	7.148
5	20 2 37.21	2.1068	17 25 36.9	4.017	5	21 40 12.26	1.9666	12 51 16.5	7.202
6	20 4 43.52	2.1036	17 21 33.5	4.097	6	21 42 10.18	1.9642	12 44 2.8	7.254
7	20 6 49.64	2.1003	17 17 25.3	4.176	7	21 44 7.96	1.9619	12 36 46.0	7.307
8	20 8 55.56	2.0971	17 13 12.4	4.254	8	21 46 5.61	1.9596	12 29 26.0	7.359
9	20 11 1.29	2.0938	17 8 54.8	4.332	9	21 48 3.12	1.9573	12 22 2.9	7.410
10	20 13 6.82	2.0906	17 4 32.6	4.409	10	21 50 0.49	1.9552	12 14 36.8	7.461
11	20 15 12.16	2.0873	17 0 5.8	4.486	11	21 51 57.74	1.9531	12 7 7.6	7.512
12	20 17 17.30	2.0841	16 55 34.3	4.562	12	21 53 54.86	1.9509	11 59 35.4	7.561
13	20 19 22.25	2.0809	16 50 58.3	4.637	13	21 55 51.85	1.9488	11 52 0.3	7.610
14	20 21 27.01	2.0777	16 46 17.8	4.712	14	21 57 48.72	1.9467	11 44 22.2	7.659
15	20 23 31.57	2.0744	16 41 32.9	4.786	15	21 59 45.46	1.9447	11 36 41.2	7.707
16	20 25 35.94	2.0712	16 36 43.5	4.860	16	22 1 42.08	1.9427	11 28 57.3	7.755
17	20 27 40.12	2.0681	16 31 49.7	4.933	17	22 3 38.58	1.9407	11 21 10.6	7.803
18	20 29 44.11	2.0649	16 26 51.5	5.007	18	22 5 34.96	1.9388	11 13 21.0	7.850
19	20 31 47.91	2.0617	16 21 48.9	5.079	19	22 7 31.23	1.9369	11 5 28.6	7.896
20	20 33 51.52	2.0587	16 16 42.0	5.150	20	22 9 27.39	1.9350	10 57 33.5	7.941
21	20 35 54.95	2.0556	16 11 30.9	5.220	21	22 11 23.43	1.9331	10 49 35.7	7.986
22	20 37 58.19	2.0524	16 6 15.6	5.290	22	22 13 19.36	1.9313	10 41 35.2	8.031
23	20 40 1.24	2.0493	16 0 56.1	5.360	23	22 15 15.19	1.9296	10 33 32.0	8.075
24	20 42 4.11	2.0463	S. 15 55 32.4	5.430	24	22 17 10.92	1.9279	S. 10 25 26.2	8.118

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 17 10.92	1.9279	S. 10 25 26.2	8.118
1	22 19 6.54	1.9262	10 17 17.8	8.161
2	22 21 2.06	1.9246	10 9 6.8	8.204
3	22 22 57.49	1.9230	10 0 53.3	8.246
4	22 24 52.82	1.9214	9 52 37.3	8.287
5	22 26 48.06	1.9199	9 44 18.8	8.329
6	22 28 43.21	1.9184	9 35 57.8	8.370
7	22 30 38.27	1.9169	9 27 34.4	8.409
8	22 32 33.24	1.9155	9 19 8.7	8.448
9	22 34 28.13	1.9142	9 10 40.6	8.488
10	22 36 22.94	1.9128	9 2 10.1	8.527
11	22 38 17.67	1.9115	8 53 37.4	8.564
12	22 40 12.32	1.9102	8 45 2.4	8.601
13	22 42 6.89	1.9090	8 36 25.2	8.638
14	22 44 1.40	1.9079	8 27 45.8	8.675
15	22 45 55.84	1.9068	8 19 4.2	8.711
16	22 47 50.21	1.9057	8 10 20.5	8.746
17	22 49 44.52	1.9047	8 1 34.7	8.781
18	22 51 38.77	1.9037	7 52 46.8	8.816
19	22 53 32.96	1.9027	7 43 56.8	8.850
20	22 55 27.09	1.9017	7 35 4.8	8.883
21	22 57 21.16	1.9008	7 26 10.9	8.915
22	22 59 15.18	1.9000	7 17 15.0	8.947
23	23 1 9.16	1.8992	S. 7 8 17.2	8.979

SATURDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 3 3.09	1.8985	S. 6 59 17.5	9.011
1	23 4 56.98	1.8977	6 50 15.9	9.042
2	23 6 50.82	1.8970	6 41 12.5	9.072
3	23 8 44.62	1.8964	6 32 7.3	9.102
4	23 10 38.39	1.8958	6 23 0.3	9.131
5	23 12 32.12	1.8952	6 13 51.6	9.159
6	23 14 25.82	1.8947	6 4 41.2	9.187
7	23 16 19.49	1.8943	5 55 29.1	9.215
8	23 18 13.14	1.8939	5 46 15.4	9.242
9	23 20 6.76	1.8935	5 37 0.1	9.268
10	23 22 0.36	1.8932	5 27 43.2	9.295
11	23 23 53.94	1.8929	5 18 24.7	9.321
12	23 25 47.51	1.8927	5 9 4.7	9.346
13	23 27 41.07	1.8925	4 59 43.2	9.370
14	23 29 34.61	1.8923	4 50 20.3	9.393
15	23 31 28.14	1.8922	4 40 56.0	9.417
16	23 33 21.67	1.8922	4 31 30.3	9.440
17	23 35 15.20	1.8921	4 22 3.2	9.462
18	23 37 8.72	1.8921	4 12 34.8	9.484
19	23 39 2.25	1.8922	4 3 5.1	9.505
20	23 40 55.78	1.8923	3 53 34.2	9.526
21	23 42 49.32	1.8924	3 44 2.0	9.547
22	23 44 42.87	1.8926	3 34 28.6	9.566
23	23 46 36.43	1.8928	3 24 54.1	9.585
24	23 48 30.01	1.8931	S. 3 15 18.4	9.604

SUNDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 48 30.01	1.8931	S. 3 15 18.4	9.604
1	23 50 23.60	1.8934	3 5 41.6	9.621
2	23 52 17.22	1.8938	2 56 3.8	9.638
3	23 54 10.86	1.8942	2 46 25.0	9.655
4	23 56 4.53	1.8947	2 36 45.2	9.672
5	23 57 58.23	1.8952	2 27 4.4	9.687
6	23 59 51.95	1.8957	2 17 22.7	9.702
7	0 1 45.71	1.8963	2 7 40.1	9.717
8	0 3 39.51	1.8970	1 57 56.7	9.731
9	0 5 33.35	1.8977	1 48 12.4	9.745
10	0 7 27.23	1.8984	1 38 27.3	9.757
11	0 9 21.15	1.8991	1 28 41.5	9.769
12	0 11 15.12	1.8999	1 18 55.0	9.781
13	0 13 9.14	1.9008	1 9 7.8	9.792
14	0 15 3.21	1.9017	0 59 19.9	9.803
15	0 16 57.34	1.9027	0 49 31.4	9.812
16	0 18 51.53	1.9037	0 39 42.4	9.821
17	0 20 45.78	1.9047	0 29 52.9	9.829
18	0 22 40.09	1.9057	0 20 2.9	9.837
19	0 24 34.47	1.9068	0 10 12.4	9.845
20	0 26 28.91	1.9079	S. 0 0 21.5	9.852
21	0 28 23.42	1.9092	N. 0 9 29.9	9.859
22	0 30 18.01	1.9105	0 19 21.6	9.864
23	0 32 12.68	1.9118	N. 0 29 13.6	9.869

MONDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 34 7.43	1.9132	N. 0 39 5.9	9.874
1	0 36 2.26	1.9145	0 48 58.5	9.877
2	0 37 57.17	1.9159	0 58 51.2	9.880
3	0 39 52.17	1.9174	1 8 44.1	9.882
4	0 41 47.26	1.9189	1 18 37.1	9.884
5	0 43 42.44	1.9204	1 28 30.2	9.886
6	0 45 37.71	1.9220	1 38 23.4	9.887
7	0 47 33.08	1.9237	1 48 16.6	9.886
8	0 49 28.55	1.9254	1 58 9.7	9.885
9	0 51 24.13	1.9272	2 8 2.8	9.884
10	0 53 19.81	1.9289	2 17 55.8	9.882
11	0 55 15.60	1.9307	2 27 48.6	9.878
12	0 57 11.49	1.9325	2 37 41.2	9.875
13	0 59 7.50	1.9344	2 47 33.6	9.871
14	1 1 3.62	1.9363	2 57 25.7	9.867
15	1 2 59.86	1.9383	3 7 17.6	9.862
16	1 4 56.22	1.9404	3 17 9.1	9.855
17	1 6 52.71	1.9425	3 27 0.2	9.847
18	1 8 49.32	1.9445	3 36 50.8	9.840
19	1 10 46.05	1.9467	3 46 41.0	9.832
20	1 12 42.92	1.9489	3 56 30.6	9.823
21	1 14 39.92	1.9512	4 6 19.7	9.813
22	1 16 37.06	1.9534	4 16 8.2	9.803
23	1 18 34.33	1.9557	4 25 56.0	9.792
24	1 20 31.74	1.9580	N. 4 35 43.2	9.781

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 20 31.74	1.9580	N. 4 35 43.2	9.781
1	1 22 29.29	1.9604	4 45 29.7	9.767
2	1 24 26.99	1.9629	4 55 15.3	9.753
3	1 26 24.84	1.9653	5 5 0.1	9.739
4	1 28 22.83	1.9678	5 14 44.0	9.724
5	1 30 20.98	1.9704	5 24 27.0	9.709
6	1 32 19.28	1.9730	5 34 9.1	9.693
7	1 34 17.74	1.9756	5 43 50.2	9.676
8	1 36 16.35	1.9782	5 53 30.2	9.658
9	1 38 15.12	1.9809	6 3 9.1	9.639
10	1 40 14.06	1.9837	6 12 46.9	9.620
11	1 42 13.16	1.9864	6 22 23.5	9.599
12	1 44 12.43	1.9892	6 31 58.8	9.578
13	1 46 11.87	1.9921	6 41 32.9	9.557
14	1 48 11.48	1.9949	6 51 5.7	9.534
15	1 50 11.26	1.9978	7 0 37.0	9.510
16	1 52 11.22	2.0008	7 10 6.9	9.487
17	1 54 11.36	2.0038	7 19 35.4	9.463
18	1 56 11.68	2.0068	7 29 2.4	9.437
19	1 58 12.18	2.0099	7 38 27.8	9.410
20	2 0 12.87	2.0130	7 47 51.6	9.382
21	2 2 13.74	2.0161	7 57 13.7	9.354
22	2 4 14.80	2.0192	8 6 34.1	9.325
23	2 6 16.05	2.0224	N. 8 15 52.7	9.296

WEDNESDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	2 8 17.49	2.0256	N. 8 25 9.6	9.266
1	2 10 19.12	2.0288	8 34 24.6	9.234
2	2 12 20.95	2.0321	8 43 37.6	9.201
3	2 14 22.98	2.0355	8 52 48.7	9.168
4	2 16 25.21	2.0388	9 1 57.8	9.134
5	2 18 27.64	2.0422	9 11 4.8	9.099
6	2 20 30.27	2.0456	9 20 9.7	9.063
7	2 22 33.11	2.0490	9 29 12.4	9.027
8	2 24 36.15	2.0524	9 38 12.9	8.990
9	2 26 39.40	2.0558	9 47 11.2	8.952
10	2 28 42.85	2.0593	9 56 7.1	8.912
11	2 30 46.52	2.0629	10 5 0.6	8.872
12	2 32 50.40	2.0664	10 13 51.7	8.831
13	2 34 54.49	2.0700	10 22 40.3	8.789
14	2 36 58.80	2.0737	10 31 26.4	8.747
15	2 39 3.33	2.0773	10 40 9.9	8.703
16	2 41 8.08	2.0810	10 48 50.8	8.659
17	2 43 13.05	2.0846	10 57 29.0	8.613
18	2 45 18.23	2.0883	11 6 4.4	8.567
19	2 47 23.64	2.0920	11 14 37.0	8.520
20	2 49 29.27	2.0957	11 23 6.8	8.472
21	2 51 35.13	2.0995	11 31 33.7	8.423
22	2 53 41.21	2.1032	11 39 57.6	8.373
23	2 55 47.52	2.1070	11 48 18.5	8.322
24	2 57 54.05	2.1108	N.11 56 36.3	8.271

THURSDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 57 54.05	2.1108	N.11 56 36.3	8.271
1	3 0 0.81	2.1146	12 4 51.0	8.218
2	3 2 7.80	2.1185	12 13 2.5	8.165
3	3 4 15.03	2.1224	12 21 10.8	8.111
4	3 6 22.49	2.1262	12 29 15.8	8.055
5	3 8 30.18	2.1301	12 37 17.4	7.999
6	3 10 38.10	2.1340	12 45 15.7	7.943
7	3 12 46.26	2.1379	12 53 10.6	7.885
8	3 14 54.65	2.1418	13 1 1.9	7.825
9	3 17 3.27	2.1457	13 8 49.6	7.765
10	3 19 12.13	2.1496	13 16 33.7	7.704
11	3 21 21.22	2.1535	13 24 14.1	7.643
12	3 23 30.55	2.1575	13 31 50.9	7.582
13	3 25 40.12	2.1614	13 39 23.9	7.518
14	3 27 49.92	2.1653	13 46 53.0	7.453
15	3 29 59.96	2.1693	13 54 18.2	7.388
16	3 32 10.24	2.1732	14 1 39.5	7.321
17	3 34 20.75	2.1772	14 8 56.7	7.253
18	3 36 31.50	2.1812	14 16 9.9	7.186
19	3 38 42.49	2.1852	14 23 19.0	7.117
20	3 40 53.72	2.1891	14 30 23.9	7.047
21	3 43 5.18	2.1930	14 37 24.6	6.977
22	3 45 16.88	2.1970	14 44 21.1	6.905
23	3 47 28.82	2.2009	N.14 51 13.2	6.831

FRIDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	3 49 40.99	2.2048	N.14 58 0.9	6.757
1	3 51 53.40	2.2088	15 4 44.1	6.683
2	3 54 6.05	2.2127	15 11 22.9	6.609
3	3 56 18.93	2.2166	15 17 57.2	6.533
4	3 58 32.04	2.2205	15 24 26.9	6.456
5	4 0 45.39	2.2244	15 30 51.9	6.377
6	4 2 58.97	2.2283	15 37 12.2	6.298
7	4 5 12.78	2.2322	15 43 27.7	6.219
8	4 7 26.83	2.2361	15 49 38.5	6.139
9	4 9 41.11	2.2399	15 55 44.4	6.057
10	4 11 55.62	2.2437	16 1 45.3	5.974
11	4 14 10.36	2.2476	16 7 41.3	5.892
12	4 16 25.33	2.2514	16 13 32.3	5.808
13	4 18 40.53	2.2552	16 19 18.2	5.723
14	4 20 55.95	2.2588	16 24 59.0	5.637
15	4 23 11.59	2.2625	16 30 34.6	5.550
16	4 25 27.45	2.2662	16 36 5.0	5.462
17	4 27 43.54	2.2700	16 41 30.1	5.374
18	4 29 59.85	2.2737	16 46 49.9	5.285
19	4 32 16.38	2.2773	16 52 4.3	5.195
20	4 34 33.13	2.2809	16 57 13.3	5.104
21	4 36 50.09	2.2844	17 2 16.8	5.012
22	4 39 7.26	2.2880	17 7 14.8	4.920
23	4 41 24.65	2.2916	17 12 7.2	4.827
24	4 43 42.25	2.2951	N.17 16 54.1	4.734

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 13.					**MONDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 43 42.25	2.2951	N.17 16 54.1	4.734	0	6 37 3.46	2.4075	N.19 3 49.0	0.464
1	4 46 0.06	2.2985	17 21 35.3	4.639	1	6 39 27.94	2.4084	19 3 17.7	0.581
2	4 48 18.07	2.3019	17 26 10.8	4.543	2	6 41 52.47	2.4092	19 2 39.3	0.698
3	4 50 36.29	2.3053	17 30 40.5	4.447	3	6 44 17.05	2.4101	19 1 53.9	0.816
4	4 52 54.71	2.3086	17 35 4.4	4.350	4	6 46 41.68	2.4109	19 1 1.4	0.933
5	4 55 13.33	2.3119	17 39 22.5	4.253	5	6 49 6.36	2.4117	19 0 1.9	1.050
6	4 57 32.14	2.3152	17 43 34.8	4.155	6	6 51 31.08	2.4123	18 58 55.4	1.167
7	4 59 51.15	2.3185	17 47 41.1	4.055	7	6 53 55.83	2.4128	18 57 41.8	1.285
8	5 2 10.36	2.3217	17 51 41.4	3.955	8	6 56 20.61	2.4132	18 56 21.2	1.402
9	5 4 29.76	2.3248	17 55 35.7	3.855	9	6 58 45.41	2.4136	18 54 53.6	1.519
10	5 6 49.34	2.3279	17 59 24.0	3.755	10	7 1 10.24	2.4140	18 53 18.9	1.637
11	5 9 9.11	2.3311	18 3 6.3	3.654	11	7 3 35.09	2.4143	18 51 37.2	1.754
12	5 11 29.07	2.3342	18 6 42.5	3.552	12	7 5 59.95	2.4145	18 49 48.4	1.872
13	5 13 49.21	2.3371	18 10 12.5	3.448	13	7 8 24.83	2.4147	18 47 52.6	1.988
14	5 16 9.52	2.3400	18 13 36.2	3.343	14	7 10 49.71	2.4148	18 45 49.8	2.105
15	5 18 30.01	2.3429	18 16 53.7	3.239	15	7 13 14.60	2.4148	18 43 40.0	2.222
16	5 20 50.67	2.3457	18 20 4.9	3.134	16	7 15 39.49	2.4148	18 41 23.2	2.338
17	5 23 11.50	2.3485	18 23 9.8	3.028	17	7 18 4.38	2.4148	18 38 59.4	2.455
18	5 25 32.49	2.3512	18 26 8.3	2.922	18	7 20 29.27	2.4147	18 36 28.6	2.572
19	5 27 53.64	2.3539	18 29 0.5	2.816	19	7 22 54.15	2.4145	18 33 50.8	2.688
20	5 30 14.96	2.3567	18 31 46.2	2.709	20	7 25 19.01	2.4143	18 31 6.1	2.803
21	5 32 36.44	2.3593	18 34 25.5	2.601	21	7 27 43.86	2.4140	18 28 14.4	2.919
22	5 34 58.08	2.3618	18 36 58.3	2.492	22	7 30 8.69	2.4136	18 25 15.8	3.035
23	5 37 19.86	2.3642	N.18 39 24.6	2.383	23	7 32 33.49	2.4132	N.18 22 10.2	3.151
	SUNDAY 14.					**TUESDAY 16.**			
0	5 39 41.79	2.3667	N.18 41 44.3	2.274	0	7 34 58.27	2.4127	N.18 18 57.7	3.266
1	5 42 3.87	2.3691	18 43 57.5	2.164	1	7 37 23.02	2.4122	18 15 38.3	3.380
2	5 44 26.09	2.3714	18 46 4.0	2.053	2	7 39 47.74	2.4117	18 12 12.1	3.494
3	5 46 48.44	2.3737	18 48 3.9	1.943	3	7 42 12.42	2.4110	18 8 39.0	3.608
4	5 49 10.93	2.3759	18 49 57.2	1.832	4	7 44 37.06	2.4103	18 4 59.1	3.722
5	5 51 33.55	2.3780	18 51 43.8	1.720	5	7 47 1.66	2.4096	18 1 12.4	3.835
6	5 53 56.29	2.3801	18 53 23.6	1.607	6	7 49 26.22	2.4089	17 57 18.9	3.948
7	5 56 19.16	2.3822	18 54 56.7	1.495	7	7 51 50.73	2.4080	17 53 18.6	4.061
8	5 58 42.15	2.3842	18 56 23.0	1.383	8	7 54 15.18	2.4071	17 49 11.6	4.173
9	6 1 5.26	2.3862	18 57 42.6	1.270	9	7 56 39.58	2.4062	17 44 57.9	4.284
10	6 3 28.49	2.3880	18 58 55.4	1.156	10	7 59 3.93	2.4053	17 40 37.5	4.396
11	6 5 51.82	2.3897	19 0 1.3	1.042	11	8 1 28.22	2.4043	17 36 10.4	4.507
12	6 8 15.26	2.3915	19 1 0.4	0.928	12	8 3 52.44	2.4032	17 31 36.6	4.618
13	6 10 38.80	2.3932	19 1 52.6	0.813	13	8 6 16.60	2.4021	17 26 56.2	4.727
14	6 13 2.44	2.3948	19 2 37.9	0.698	14	8 8 40.69	2.4009	17 22 9.3	4.837
15	6 15 26.18	2.3964	19 3 16.3	0.583	15	8 11 4.71	2.3996	17 17 15.8	4.946
16	6 17 50.01	2.3978	19 3 47.8	0.468	16	8 13 28.66	2.3986	17 12 15.8	5.054
17	6 20 13.92	2.3992	19 4 12.4	0.352	17	8 15 52.54	2.3973	17 7 9.3	5.162
18	6 22 37.92	2.4006	19 4 30.0	0.235	18	8 18 16.34	2.3960	17 1 56.3	5.270
19	6 25 2.00	2.4019	19 4 40.6	0.119	19	8 20 40.06	2.3947	16 56 36.9	5.377
20	6 27 26.15	2.4032	19 4 44.3	+ 0.003	20	8 23 3.70	2.3933	16 51 11.1	5.483
21	6 29 50.38	2.4044	19 4 41.0	− 0.113	21	8 25 27.25	2.3918	16 45 39.0	5.588
22	6 32 14.68	2.4055	19 4 30.7	0.230	22	8 27 50.71	2.3903	16 40 0.5	5.693
23	6 34 39.04	2.4065	19 4 13.4	0.347	23	8 30 14.09	2.3889	16 34 15.8	5.798
24	6 37 3.46	2.4075	N.19 3 49.0	0.464	24	8 32 37.38	2.3874	N.16 28 24.8	5.902

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 17.					**FRIDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 32 37.38	2.3874	N.16 28 24.8	5.902	0	10 25 8.00	2.2990	N.10 0 1.0	9.946
1	8 35 0.58	2.3858	16 22 27.6	6.004	1	10 27 25.89	2.2972	9 50 2.4	10.007
2	8 37 23.68	2.3843	16 16 24.3	6.107	2	10 29 43.67	2.2955	9 40 0.1	10.067
3	8 39 46.69	2.3827	16 10 14.8	6.209	3	10 32 1.35	2.2938	9 29 54.3	10.126
4	8 42 9.60	2.3810	16 3 59.2	6.310	4	10 34 18.93	2.2922	9 19 45.0	10.184
5	8 44 32.41	2.3793	15 57 37.6	6.411	5	10 36 36.41	2.2906	9 9 32.2	10.242
6	8 46 55.12	2.3776	15 51 9.9	6.511	6	10 38 53.80	2.2890	8 59 15.9	10.299
7	8 49 17.72	2.3759	15 44 36.3	6.609	7	10 41 11.09	2.2873	8 48 56.3	10.353
8	8 51 40.22	2.3743	15 37 56.8	6.708	8	10 43 28.28	2.2857	8 38 33.5	10.407
9	8 54 2.63	2.3726	15 31 11.4	6.806	9	10 45 45.38	2.2842	8 28 7.5	10.460
10	8 56 24.93	2.3708	15 24 20.1	6.903	10	10 48 2.39	2.2827	8 17 38.3	10.512
11	8 58 47.12	2.3689	15 17 23.0	6.999	11	10 50 19.31	2.2812	8 7 6.1	10.562
12	9 1 9.20	2.3671	15 10 20.2	7.094	12	10 52 36.13	2.2797	7 56 30.9	10.612
13	9 3 31.17	2.3652	15 3 11.7	7.188	13	10 54 52.87	2.2782	7 45 52.7	10.661
14	9 5 53.03	2.3634	14 55 57.6	7.282	14	10 57 9.52	2.2768	7 35 11.6	10.707
15	9 8 14.78	2.3616	14 48 37.8	7.376	15	10 59 26.09	2.2755	7 24 27.8	10.753
16	9 10 36.42	2.3597	14 41 12.5	7.468	16	11 1 42.58	2.2742	7 13 41.2	10.799
17	9 12 57.94	2.3577	14 33 41.7	7.559	17	11 3 58.99	2.2728	7 2 51.9	10.843
18	9 15 19.35	2.3558	14 26 5.4	7.650	18	11 6 15.31	2.2714	6 52 0.0	10.887
19	9 17 40.64	2.3539	14 18 23.7	7.740	19	11 8 31.56	2.2702	6 41 5.5	10.928
20	9 20 1.82	2.3521	14 10 36.6	7.829	20	11 10 47.74	2.2690	6 30 8.6	10.968
21	9 22 22.89	2.3502	14 2 44.2	7.917	21	11 13 3.84	2.2678	6 19 9.3	11.008
22	9 24 43.84	2.3482	13 54 46.6	8.003	22	11 15 19.87	2.2666	6 8 7.6	11.047
23	9 27 4.68	2.3463	N.13 46 43.8	8.090	23	11 17 35.83	2.2655	N. 5 57 3.7	11.083
	THURSDAY 18.					**SATURDAY 20.**			
0	9 29 25.40	2.3443	N.13 38 35.8	8.176	0	11 19 51.73	2.2644	N. 5 45 57.6	11.119
1	9 31 46.00	2.3423	13 30 22.7	8.260	1	11 22 7.56	2.2633	5 34 49.4	11.155
2	9 34 6.48	2.3404	13 22 4.6	8.343	2	11 24 23.33	2.2622	5 23 39.0	11.190
3	9 36 26.85	2.3385	13 13 41.5	8.426	3	11 26 39.03	2.2612	5 12 26.6	11.222
4	9 38 47.10	2.3365	13 5 13.4	8.509	4	11 28 54.67	2.2602	5 1 12.3	11.253
5	9 41 7.23	2.3346	12 56 40.4	8.590	5	11 31 10.26	2.2593	4 49 56.2	11.283
6	9 43 27.25	2.3327	12 48 2.6	8.670	6	11 33 25.79	2.2584	4 38 38.3	11.313
7	9 45 47.15	2.3307	12 39 20.0	8.749	7	11 35 41.27	2.2576	4 27 18.6	11.342
8	9 48 6.93	2.3287	12 30 32.7	8.827	8	11 37 56.70	2.2567	4 15 57.3	11.368
9	9 50 26.60	2.3268	12 21 40.7	8.905	9	11 40 12.08	2.2559	4 4 34.4	11.394
10	9 52 46.15	2.3249	12 12 44.1	8.981	10	11 42 27.41	2.2552	3 53 10.0	11.419
11	9 55 5.59	2.3230	12 3 43.0	9.056	11	11 44 42.70	2.2544	3 41 44.1	11.443
12	9 57 24.91	2.3210	11 54 37.4	9.130	12	11 46 57.94	2.2537	3 30 16.8	11.466
13	9 59 44.11	2.3191	11 45 27.4	9.203	13	11 49 13.14	2.2531	3 18 48.2	11.487
14	10 2 3.20	2.3172	11 36 13.0	9.276	14	11 51 28.31	2.2525	3 7 18.4	11.506
15	10 4 22.18	2.3154	11 26 54.2	9.348	15	11 53 43.44	2.2519	2 55 47.5	11.524
16	10 6 41.05	2.3135	11 17 31.1	9.419	16	11 55 58.54	2.2514	2 44 15.5	11.542
17	10 8 59.80	2.3116	11 8 3.9	9.488	17	11 58 13.61	2.2508	2 32 42.4	11.560
18	10 11 18.44	2.3097	10 58 32.6	9.556	18	12 0 28.64	2.2503	2 21 8.3	11.576
19	10 13 36.97	2.3079	10 48 57.2	9.624	19	12 2 43.65	2.2499	2 9 33.3	11.589
20	10 15 55.39	2.3061	10 39 17.7	9.691	20	12 4 58.63	2.2495	1 57 57.6	11.601
21	10 18 13.70	2.3043	10 29 34.3	9.756	21	12 7 13.59	2.2492	1 46 21.2	11.613
22	10 20 31.91	2.3025	10 19 47.0	9.820	22	12 9 28.53	2.2488	1 34 44.1	11.624
23	10 22 50.01	2.3007	10 9 55.9	9.883	23	12 11 43.45	2.2486	1 23 6.3	11.634
24	10 25 8.00	2.2990	N.10 0 1.0	9.946	24	12 13 58.36	2.2483	N. 1 11 28.0	11.642

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 13 58.36	2.2483	N. 1 11 28.0	11.642
1	12 16 13.25	2.2481	0 59 49.2	11.649
2	12 18 28.13	2.2479	0 48 10.1	11.654
3	12 20 43.00	2.2478	0 36 30.7	11.659
4	12 22 57.86	2.2477	0 24 51.0	11.662
5	12 25 12.72	2.2477	0 13 11.2	11.664
6	12 27 27.58	2.2476	N. 0 1 31.3	11.666
7	12 29 42.43	2.2476	S. 0 10 8.7	11.666
8	12 31 57.29	2.2477	0 21 48.6	11.664
9	12 34 12.15	2.2478	0 33 28.4	11.662
10	12 36 27.02	2.2479	0 45 8.0	11.658
11	12 38 41.90	2.2480	0 56 47.3	11.653
12	12 40 56.78	2.2482	1 8 26.3	11.647
13	12 43 11.68	2.2484	1 20 4.9	11.639
14	12 45 26.59	2.2486	1 31 43.0	11.631
15	12 47 41.51	2.2488	1 43 20.6	11.621
16	12 49 56.45	2.2492	1 54 57.5	11.609
17	12 52 11.42	2.2496	2 6 33.7	11.597
18	12 54 26.41	2.2500	2 18 9.2	11.584
19	12 56 41.42	2.2504	2 29 43.8	11.569
20	12 58 56.46	2.2508	2 41 17.5	11.554
21	13 1 11.52	2.2512	2 52 50.3	11.537
22	13 3 26.61	2.2518	3 4 22.0	11.518
23	13 5 41.74	2.2524	S. 3 15 52.5	11.499

MONDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 7 56.90	2.2530	S. 3 27 21.9	11.479
1	13 10 12.10	2.2536	3 38 50.0	11.457
2	13 12 27.33	2.2542	3 50 16.7	11.433
3	13 14 42.60	2.2548	4 1 42.0	11.409
4	13 16 57.91	2.2555	4 13 5.8	11.384
5	13 19 13.26	2.2563	4 24 28.1	11.357
6	13 21 28.66	2.2571	4 35 48.7	11.329
7	13 23 44.11	2.2578	4 47 7.6	11.301
8	13 25 59.60	2.2586	4 58 24.8	11.271
9	13 28 15.14	2.2594	5 9 40.1	11.239
10	13 30 30.73	2.2603	5 20 53.5	11.207
11	13 32 46.37	2.2612	5 32 4.9	11.173
12	13 35 2.07	2.2621	5 43 14.2	11.138
13	13 37 17.82	2.2630	5 54 21.4	11.102
14	13 39 33.63	2.2640	6 5 26.4	11.064
15	13 41 49.50	2.2649	6 16 29.1	11.025
16	13 44 5.42	2.2659	6 27 29.4	10.986
17	13 46 21.40	2.2669	6 38 27.4	10.946
18	13 48 37.45	2.2680	6 49 22.9	10.903
19	13 50 53.56	2.2690	7 0 15.8	10.860
20	13 53 9.73	2.2700	7 11 6.1	10.816
21	13 55 25.96	2.2711	7 21 53.7	10.771
22	13 57 42.26	2.2722	7 32 38.6	10.724
23	13 59 58.63	2.2734	7 43 20.6	10.676
24	14 2 15.07	2.2746	S. 7 53 59.7	10.627

TUESDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 2 15.07	2.2746	S. 7 53 59.7	10.627
1	14 4 31.58	2.2757	8 4 35.9	10.577
2	14 6 48.16	2.2768	8 15 9.0	10.526
3	14 9 4.80	2.2779	8 25 39.0	10.474
4	14 11 21.51	2.2792	8 36 5.9	10.421
5	14 13 38.30	2.2804	8 46 29.5	10.366
6	14 15 55.16	2.2816	8 56 49.8	10.310
7	14 18 12.09	2.2828	9 7 6.7	10.253
8	14 20 29.10	2.2841	9 17 20.2	10.196
9	14 22 46.18	2.2853	9 27 30.2	10.137
10	14 25 3.34	2.2866	9 37 36.7	10.077
11	14 27 20.57	2.2878	9 47 39.5	10.016
12	14 29 37.87	2.2890	9 57 38.6	9.954
13	14 31 55.25	2.2903	10 7 34.0	9.892
14	14 34 12.71	2.2916	10 17 25.6	9.827
15	14 36 30.24	2.2928	10 27 13.2	9.761
16	14 38 47.85	2.2941	10 36 56.9	9.695
17	14 41 5.53	2.2953	10 46 36.6	9.627
18	14 43 23.28	2.2965	10 56 12.2	9.559
19	14 45 41.11	2.2978	11 5 43.7	9.490
20	14 47 59.02	2.2991	11 15 11.0	9.419
21	14 50 17.00	2.3003	11 24 34.0	9.348
22	14 52 35.06	2.3016	11 33 52.7	9.276
23	14 54 53.19	2.3028	S. 11 43 7.1	9.203

WEDNESDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 57 11.40	2.3041	S. 11 52 17.1	9.129
1	14 59 29.68	2.3053	12 1 22.6	9.053
2	15 1 48.03	2.3065	12 10 23.5	8.977
3	15 4 6.46	2.3077	12 19 19.8	8.899
4	15 6 24.96	2.3088	12 28 11.4	8.821
5	15 8 43.52	2.3100	12 36 58.3	8.742
6	15 11 2.16	2.3112	12 45 40.4	8.662
7	15 13 20.87	2.3124	12 54 17.7	8.582
8	15 15 39.65	2.3135	13 2 50.2	8.501
9	15 17 58.49	2.3146	13 11 17.8	8.418
10	15 20 17.40	2.3157	13 19 40.4	8.334
11	15 22 36.38	2.3168	13 27 57.9	8.249
12	15 24 55.42	2.3178	13 36 10.3	8.164
13	15 27 14.52	2.3189	13 44 17.6	8.078
14	15 29 33.69	2.3200	13 52 19.7	7.992
15	15 31 52.92	2.3210	14 0 16.6	7.904
16	15 34 12.21	2.3220	14 8 8.2	7.816
17	15 36 31.56	2.3229	14 15 54.5	7.727
18	15 38 50.96	2.3238	14 23 35.4	7.637
19	15 41 10.42	2.3247	14 31 10.9	7.546
20	15 43 29.93	2.3256	14 38 40.9	7.454
21	15 45 49.49	2.3264	14 46 5.4	7.362
22	15 48 9.10	2.3272	14 53 24.4	7.270
23	15 50 28.76	2.3280	15 0 37.8	7.176
24	15 52 48.46	2.3287	S. 15 7 45.5	7.082

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 52 48.46	2.3287	S.15 7 45.5	7.082
1	15 55 8.21	2.3295	15 14 47.6	6.987
2	15 57 28.00	2.3302	15 21 43.9	6.891
3	15 59 47.83	2.3308	15 28 34.5	6.795
4	16 2 7.70	2.3315	15 35 19.3	6.698
5	16 4 27.61	2.3321	15 41 58.3	6.601
6	16 6 47.55	2.3327	15 48 31.4	6.503
7	16 9 7.53	2.3332	15 54 58.6	6.404
8	16 11 27.53	2.3336	16 1 19.9	6.305
9	16 13 47.56	2.3340	16 7 35.2	6.205
10	16 16 7.61	2.3343	16 13 44.5	6.105
11	16 18 27.68	2.3347	16 19 47.8	6.004
12	16 20 47.78	2.3351	16 25 45.0	5.903
13	16 23 7.89	2.3354	16 31 36.1	5.801
14	16 25 28.02	2.3356	16 37 21.1	5.698
15	16 27 48.16	2.3358	16 42 59.9	5.596
16	16 30 8.31	2.3359	16 48 32.6	5.493
17	16 32 28.47	2.3360	16 53 59.1	5.389
18	16 34 48.63	2.3360	16 59 19.3	5.285
19	16 37 8.79	2.3360	17 4 33.3	5.181
20	16 39 28.95	2.3360	17 9 41.0	5.076
21	16 41 49.11	2.3359	17 14 42.4	4.971
22	16 44 9.26	2.3358	17 19 37.5	4.865
23	16 46 29.40	2.3356	S.17 24 26.2	4.759

FRIDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	16 48 49.53	2.3353	S.17 29 8.6	4.653
1	16 51 9.64	2.3350	17 33 44.6	4.547
2	16 53 29.73	2.3347	17 38 14.2	4.440
3	16 55 49.81	2.3344	17 42 37.4	4.333
4	16 58 9.86	2.3339	17 46 54.2	4.226
5	17 0 29.88	2.3333	17 51 4.5	4.118
6	17 2 49.86	2.3327	17 55 8.4	4.011
7	17 5 9.81	2.3322	17 59 5.8	3.903
8	17 7 29.72	2.3316	18 2 56.7	3.795
9	17 9 49.60	2.3309	18 6 41.2	3.687
10	17 12 9.43	2.3302	18 10 19.1	3.578
11	17 14 29.22	2.3294	18 13 50.5	3.469
12	17 16 48.96	2.3286	18 17 15.4	3.361
13	17 19 8.65	2.3277	18 20 33.8	3.252
14	17 21 28.28	2.3267	18 23 45.7	3.143
15	17 23 47.85	2.3257	18 26 51.0	3.034
16	17 26 7.36	2.3246	18 29 49.8	2.925
17	17 28 26.80	2.3234	18 32 42.0	2.816
18	17 30 46.17	2.3223	18 35 27.7	2.707
19	17 33 5.47	2.3211	18 38 6.9	2.598
20	17 35 24.70	2.3198	18 40 39.5	2.489
21	17 37 43.85	2.3185	18 43 5.6	2.381
22	17 40 2.92	2.3171	18 45 25.2	2.272
23	17 42 21.90	2.3156	18 47 38.2	2.163
24	17 44 40.79	2.3141	S.18 49 44.7	2.054

SATURDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 44 40.79	2.3141	S.18 49 44.7	2.054
1	17 46 59.59	2.3126	18 51 44.7	1.946
2	17 49 18.30	2.3110	18 53 38.2	1.837
3	17 51 36.91	2.3093	18 55 25.1	1.728
4	17 53 55.42	2.3076	18 57 5.5	1.619
5	17 56 13.83	2.3059	18 58 39.4	1.511
6	17 58 32.13	2.3041	19 0 6.8	1.403
7	18 0 50.32	2.3022	19 1 27.7	1.295
8	18 3 8.40	2.3003	19 2 42.2	1.187
9	18 5 26.36	2.2984	19 3 50.2	1.079
10	18 7 44.21	2.2964	19 4 51.7	0.972
11	18 10 1.93	2.2943	19 5 46.8	0.865
12	18 12 19.53	2.2922	19 6 35.5	0.758
13	18 14 37.00	2.2901	19 7 17.8	0.652
14	18 16 54.34	2.2879	19 7 53.7	0.545
15	18 19 11.55	2.2856	19 8 23.2	0.439
16	18 21 28.62	2.2833	19 8 46.4	0.333
17	18 23 45.55	2.2810	19 9 3.2	0.227
18	18 26 2.34	2.2786	19 9 13.7	0.122
19	18 28 18.98	2.2762	19 9 17.9	− 0.017
20	18 30 35.48	2.2738	19 9 15.8	+ 0.087
21	18 32 51.83	2.2713	19 9 7.5	0.191
22	18 35 8.03	2.2687	19 8 52.9	0.295
23	18 37 24.07	2.2660	S.19 8 32.1	0.398

SUNDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 39 39.95	2.2633	S.19 8 5.1	0.501
1	18 41 55.67	2.2607	19 7 31.9	0.604
2	18 44 11.23	2.2580	19 6 52.6	0.706
3	18 46 26.63	2.2552	19 6 7.1	0.808
4	18 48 41.86	2.2524	19 5 15.6	0.909
5	18 50 56.92	2.2496	19 4 18.0	1.011
6	18 53 11.82	2.2466	19 3 14.3	1.112
7	18 55 26.54	2.2436	19 2 4.6	1.212
8	18 57 41.08	2.2409	19 0 48.9	1.311
9	18 59 55.45	2.2380	18 59 27.3	1.410
10	19 2 9.64	2.2349	18 57 59.7	1.509
11	19 4 23.64	2.2318	18 56 26.2	1.607
12	19 6 37.45	2.2287	18 54 46.8	1.705
13	19 8 51.08	2.2256	18 53 1.6	1.802
14	19 11 4.52	2.2225	18 51 10.6	1.898
15	19 13 17.78	2.2194	18 49 13.8	1.995
16	19 15 30.85	2.2162	18 47 11.2	2.092
17	19 17 43.72	2.2130	18 45 2.8	2.188
18	19 19 56.40	2.2096	18 42 48.7	2.282
19	19 22 8.88	2.2063	18 40 29.0	2.375
20	19 24 21.16	2.2031	18 38 3.7	2.469
21	19 26 33.25	2.1998	18 35 32.7	2.562
22	19 28 45.14	2.1965	18 32 56.2	2.654
23	19 30 56.83	2.1931	18 30 14.2	2.746
24	19 33 8.31	2.1897	S.18 27 26.7	2.837

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 33 8.31	2.1897	S. 18 27 26.7	2.837
1	19 35 19.59	2.1862	18 24 33.7	2.928
2	19 37 30.66	2.1828	18 21 35.3	3.016
3	19 39 41.53	2.1794	18 18 31.5	3.107
4	19 41 52.19	2.1759	18 15 22.4	3.197
5	19 44 2.64	2.1725	18 12 7.9	3.286
6	19 46 12.89	2.1691	18 8 48.1	3.373
7	19 48 22.93	2.1655	18 5 23.1	3.460
8	19 50 32.75	2.1619	18 1 52.9	3.547
9	19 52 42.36	2.1584	17 58 17.5	3.633
10	19 54 51.76	2.1549	17 54 36.9	3.719
11	19 57 0.95	2.1514	17 50 51.2	3.804
12	19 59 9.93	2.1478	17 47 0.4	3.888
13	20 1 18.69	2.1442	17 43 4.6	3.972
14	20 3 27.24	2.1407	17 39 3.8	4.054
15	20 5 35.58	2.1372	17 34 58.1	4.136
16	20 7 43.70	2.1336	17 30 47.4	4.218
17	20 9 51.61	2.1300	17 26 31.9	4.299
18	20 11 59.30	2.1264	17 22 11.5	4.380
19	20 14 6.78	2.1228	17 17 46.3	4.460
20	20 16 14.04	2.1192	17 13 16.3	4.539
21	20 18 21.08	2.1156	17 8 41.6	4.617
22	20 20 27.91	2.1121	17 4 2.2	4.695
23	20 22 34.53	2.1085	S. 16 59 18.2	4.773

TUESDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	20 24 40.93	2.1049	S. 16 54 29.5	4.850
1	20 26 47.12	2.1013	16 49 36.2	4.926
2	20 28 53.09	2.0977	16 44 38.1	5.001
3	20 30 58.85	2.0943	16 39 36.1	5.075
4	20 33 4.40	2.0907	16 34 29.4	5.149
5	20 35 9.73	2.0871	16 29 18.2	5.223
6	20 37 14.85	2.0836	16 24 2.6	5.296
7	20 39 19.76	2.0800	16 18 42.7	5.368
8	20 41 24.45	2.0764	16 13 18.5	5.439
9	20 43 28.93	2.0729	16 7 50.0	5.511
10	20 45 33.20	2.0695	16 2 17.2	5.582
11	20 47 37.27	2.0661	15 56 40.2	5.651
12	20 49 41.13	2.0626	15 50 59.1	5.719
13	20 51 44.78	2.0591	15 45 13.9	5.788
14	20 53 48.22	2.0557	15 39 24.6	5.856
15	20 55 51.46	2.0522	15 33 31.2	5.923
16	20 57 54.49	2.0488	15 27 33.8	5.989
17	20 59 57.32	2.0454	15 21 32.5	6.055
18	21 1 59.94	2.0420	15 15 27.2	6.121
19	21 4 2.36	2.0387	15 9 18.0	6.185
20	21 6 4.58	2.0353	15 3 5.0	6.248
21	21 8 6.60	2.0320	14 56 48.2	6.312
22	21 10 8.42	2.0287	14 50 27.6	6.375
23	21 12 10.05	2.0255	14 44 3.2	6.437
24	21 14 11.48	2.0222	S. 14 37 35.1	6.499

WEDNESDAY, DECEMBER 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 14 11.48	2.0222	S. 14 37 35.1	6.499

PHASES OF THE MOON.

		d	h	m
☽ First Quarter	. Nov.	3	5	5.2
○ Full Moon		11	7	6.5
☾ Last Quarter. . . .		18	10	40.4
● New Moon		25	7	18.5

		d	h
☾ Apogee. . . .	Nov.	5	6.5
☾ Perigee.		20	19.3

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Sun	W.	65° 18′ 9″	3216	66° 43′ 59″	3231	68° 9′ 32″	3245	69° 34′ 48″	3259
	Antares	W.	37 1 59	3004	38 32 7	3006	40 2 12	3010	41 32 12	3016
	Mars	W.	25 14 55	3233	26 40 25	3235	28 5 53	3239	29 31 16	3244
	Fomalhaut	E.	53 17 9	3344	51 53 48	3379	50 31 8	3417	49 9 11	3458
	α Pegasi	E.	67 38 0	3187	66 11 35	3209	64 45 37	3232	63 20 6	3256
2	Sun	W.	76 37 4	3325	78 0 46	3337	79 24 15	3349	80 47 30	3359
	Antares	W.	49 0 31	3044	50 29 49	3051	51 58 59	3057	53 28 1	3064
	Mars	W.	36 36 25	3278	38 1 2	3286	39 25 30	3294	40 49 49	3301
	Fomalhaut	E.	42 31 28	3697	41 14 38	3756	39 58 50	3819	38 44 7	3888
	α Pegasi	E.	56 19 39	3384	54 57 4	3411	53 35 0	3439	52 13 28	3470
	α Arietis	E.	98 45 31	3079	97 16 56	3089	95 48 33	3099	94 20 22	3109
3	Sun	W.	87 40 50	3407	89 2 58	3415	90 24 57	3422	91 46 48	3429
	Antares	W.	60 51 18	3092	62 19 37	3098	63 47 49	3103	65 15 55	3107
	Mars	W.	47 49 17	3336	49 12 47	3342	50 36 10	3347	51 59 27	3352
	α Pegasi	E.	45 34 51	3647	44 17 7	3690	43 0 9	3736	41 44 0	3786
	α Arietis	E.	87 2 14	3152	85 35 7	3160	84 8 10	3168	82 41 23	3175
4	Sun	W.	98 34 15	3457	99 55 27	3462	101 16 34	3465	102 37 37	3468
	Antares	W.	72 35 12	3126	74 2 50	3128	75 30 26	3129	76 58 0	3131
	Mars	W.	58 54 29	3373	60 17 16	3377	61 39 59	3379	63 2 40	3380
	α Aquilæ	W.	34 8 7	5105	35 3 41	4959	36 1 9	4827	37 0 23	4710
	α Arietis	E.	75 29 27	3208	74 3 27	3213	72 37 33	3219	71 11 46	3224
	Aldebaran	E.	107 39 11	3058	106 10 10	3061	104 41 13	3064	103 12 20	3066
5	Sun	W.	109 22 15	3475	110 43 7	3475	112 3 59	3475	113 24 51	3474
	Antares	W.	84 15 28	3133	85 42 57	3133	87 10 26	3133	88 37 56	3132
	Mars	W.	69 55 43	3383	71 18 19	3382	72 40 56	3381	74 3 34	3380
	α Aquilæ	W.	42 18 28	4275	43 25 44	4210	44 34 1	4151	45 43 14	4096
	α Arietis	E.	64 4 17	3247	62 39 4	3252	61 13 56	3256	59 48 53	3260
	Aldebaran	E.	95 48 27	3072	94 19 43	3072	92 50 59	3071	91 22 14	3069
6	Sun	W.	120 9 37	3463	121 30 43	3460	122 51 52	3456	124 13 5	3452
	Antares	W.	95 55 57	3119	97 23 43	3116	98 51 33	3112	100 19 28	3109
	Mars	W.	80 57 20	3365	82 20 17	3361	83 43 18	3357	85 6 24	3351
	α Aquilæ	W.	51 41 24	3878	52 55 6	3842	54 9 25	3808	55 24 19	3777
	α Arietis	E.	52 44 58	3285	51 20 29	3291	49 56 7	3297	48 31 52	3304
	Aldebaran	E.	83 57 56	3057	82 28 54	3053	80 59 47	3049	79 30 35	3045
7	α Aquilæ	W.	61 46 24	3644	63 4 11	3621	64 22 23	3598	65 40 59	3578
	α Arietis	E.	41 33 2	3355	40 9 54	3371	38 47 4	3388	37 24 34	3406
	Aldebaran	E.	72 3 5	3017	70 33 13	3010	69 3 13	3003	67 33 4	2997
8	α Aquilæ	W.	72 19 26	3484	73 40 8	3467	75 1 9	3451	76 22 28	3435
	Fomalhaut	W.	39 22 56	3788	40 38 11	3728	41 54 28	3674	43 11 43	3624
	Aldebaran	E.	60 0 1	2956	58 28 53	2948	56 57 35	2939	55 26 6	2930
9	α Aquilæ	W.	83 13 16	3365	84 36 12	3353	85 59 22	3341	87 22 46	3331
	Fomalhaut	W.	49 50 17	3423	51 12 8	3389	52 34 37	3358	53 57 42	3329
	α Pegasi	W.	36 12 2	3825	37 26 38	3750	38 42 32	3683	39 59 37	3621
	Aldebaran	E.	47 45 41	2882	46 12 59	2872	44 40 4	2862	43 6 56	2852

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Sun	W.	70° 59′ 47″	3273	72° 24′ 30″	3287	73° 48′ 57″	3300	75° 13′ 8″	3313
	Antares	W.	43 2 5	3021	44 31 52	3026	46 1 32	3032	47 31 5	3038
	Mars	W.	30 56 33	3250	32 21 43	3257	33 46 45	3264	35 11 39	3270
	Fomalhaut	E.	47 48 0	3500	46 27 36	3545	45 8 1	3591	43 49 17	3642
	α Pegasi	E.	61 55 3	3280	60 30 28	3305	59 6 22	3330	57 42 45	3357
2	Sun	W.	82 10 33	3370	83 33 24	3380	84 56 3	3389	86 18 32	3399
	Antares	W.	54 56 55	3069	56 25 42	3076	57 54 21	3082	59 22 53	3087
	Mars	W.	42 13 59	3308	43 38 1	3316	45 1 54	3323	46 25 39	3329
	Fomalhaut	E.	37 30 35	3963	36 18 19	4047	35 7 26	4139	33 58 2	4241
	α Pegasi	E.	50 52 30	3502	49 32 8	3535	48 12 23	3571	46 53 17	3608
	α Arietis	E.	92 52 23	3118	91 24 35	3127	89 56 58	3135	88 29 31	3143
3	Sun	W.	93 8 32	3436	94 30 8	3442	95 51 37	3448	97 12 59	3454
	Antares	W.	66 43 56	3111	68 11 52	3115	69 39 43	3119	71 7 30	3123
	Mars	W.	53 22 38	3358	54 45 43	3362	56 8 43	3366	57 31 38	3370
	α Pegasi	E.	40 28 43	3839	39 14 21	3897	38 0 58	3960	36 48 39	4030
	α Arietis	E.	81 14 44	3182	79 48 13	3188	78 21 50	3195	76 55 35	3201
4	Sun	W.	103 58 37	3470	105 19 35	3472	106 40 30	3474	108 1 23	3475
	Antares	W.	78 25 32	3133	79 53 2	3133	81 20 31	3133	82 48 0	3134
	Mars	W.	64 25 19	3381	65 47 57	3383	67 10 33	3384	68 33 8	3384
	α Aquilæ	W.	38 1 14	4604	39 3 35	4510	40 7 18	4424	41 12 18	4346
	α Arietis	E.	69 46 5	3229	68 20 30	3233	66 55 0	3238	65 29 36	3242
	Aldebaran	E.	101 43 29	3069	100 14 41	3070	98 45 55	3072	97 17 11	3072
5	Sun	W.	114 45 44	3472	116 6 39	3471	117 27 36	3469	118 48 35	3467
	Antares	W.	90 5 27	3130	91 33 0	3128	93 0 36	3125	94 28 15	3123
	Mars	W.	75 26 13	3378	76 48 55	3375	78 11 40	3372	79 34 28	3369
	α Aquilæ	W.	46 53 20	4045	48 4 15	3999	49 15 56	3955	50 28 20	3916
	α Arietis	E.	58 23 55	3265	56 59 3	3270	55 34 16	3274	54 9 34	3279
	Aldebaran	E.	89 53 27	3068	88 24 38	3066	86 55 47	3064	85 26 53	3061
6	Sun	W.	125 34 23	3447	126 55 46	3442	128 17 15	3438	129 38 49	3431
	Antares	W.	101 47 27	3105	103 15 31	3100	104 43 41	3096	106 11 56	3091
	Mars	W.	86 29 36	3345	87 52 55	3340	89 16 20	3335	90 39 51	3329
	α Aquilæ	W.	56 39 45	3747	57 55 42	3720	59 12 8	3693	60 29 3	3668
	α Arietis	E.	47 7 45	3313	45 43 48	3321	44 20 1	3331	42 56 25	3342
	Aldebaran	E.	78 1 18	3040	76 31 55	3034	75 2 25	3030	73 32 49	3023
7	α Aquilæ	W.	66 59 57	3557	68 19 18	3538	69 39 0	3519	70 59 3	3501
	α Arietis	E.	36 2 27	3432	34 40 47	3459	33 19 37	3490	31 59 2	3528
	Aldebaran	E.	66 2 47	2989	64 32 20	2981	63 1 44	2973	61 30 58	2965
8	α Aquilæ	W.	77 44 5	3420	79 5 59	3406	80 28 9	3392	81 50 35	3379
	Fomalhaut	W.	44 29 51	3578	45 48 49	3535	47 8 35	3495	48 29 5	3457
	Aldebaran	E.	53 54 25	2920	52 22 32	2911	50 50 27	2901	49 18 10	2892
9	α Aquilæ	W.	88 46 22	3319	90 10 11	3309	91 34 12	3300	92 58 24	3290
	Fomalhaut	W.	55 21 20	3300	56 45 31	3274	58 10 13	3248	59 35 25	3225
	α Pegasi	W.	41 17 49	3565	42 37 2	3513	43 57 12	3464	45 18 16	3420
	Aldebaran	E.	41 33 36	2842	40 0 3	2831	38 26 16	2821	36 52 15	2810

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LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
9	Pollux E.	91° 44′ 21″	2950	90° 13′ 5″	2939	88° 41′ 36″	2930	87° 9′ 55″	2920
	SATURN E.	92 9 19	2885	90 36 41	2874	89 3 49	2864	87 30 44	2854
10	Fomalhaut W.	61 1 5	3202	62 27 12	3180	63 53 45	3158	65 20 44	3138
	α Pegasi W.	46 40 10	3379	48 2 51	3341	49 26 15	3305	50 50 21	3271
	Aldebaran E.	35 18 0	2800	33 43 32	2790	32 8 51	2779	30 33 56	2769
	Pollux E.	79 28 17	2870	77 55 20	2860	76 22 10	2851	74 48 48	2842
	SATURN E.	79 42 0	2802	78 7 35	2792	76 32 56	2781	74 58 3	2771
11	Fomalhaut W.	72 41 22	3050	74 10 33	3034	75 40 3	3020	77 9 51	3005
	α Pegasi W.	57 59 58	3130	59 27 31	3107	60 55 32	3084	62 24 1	3063
	SATURN E.	67 0 15	2719	65 24 0	2709	63 47 32	2699	62 10 51	2689
	Pollux E.	66 58 59	2797	65 24 27	2789	63 49 45	2781	62 14 52	2773
	Regulus E.	102 42 58	2717	101 6 41	2707	99 30 10	2697	97 53 26	2687
12	Fomalhaut W.	84 43 6	2943	86 14 30	2932	87 46 8	2922	89 17 59	2912
	α Pegasi W.	69 52 33	2971	71 23 22	2956	72 54 30	2941	74 25 57	2926
	α Arietis W.	26 53 38	3374	28 16 24	3290	29 40 47	3218	31 6 35	3154
	SATURN E.	54 4 7	2641	52 26 8	2632	50 47 56	2623	49 9 32	2615
	Pollux E.	54 18 8	2741	52 42 23	2737	51 6 32	2732	49 30 35	2729
	Regulus E.	89 46 23	2638	88 8 19	2628	86 30 2	2618	84 51 32	2610
13	Fomalhaut W.	97 0 0	2874	98 32 52	2868	100 5 52	2863	101 38 58	2859
	α Pegasi W.	82 7 30	2865	83 40 34	2855	85 13 51	2845	86 47 20	2836
	α Arietis W.	38 32 10	2927	40 3 54	2895	41 36 19	2866	43 9 22	2838
	SATURN E.	40 54 41	2574	39 15 10	2566	37 35 28	2559	35 55 37	2552
	Pollux E.	41 30 2	2725	39 53 55	2728	38 17 52	2733	36 41 56	2741
	Regulus E.	76 35 58	2565	74 56 15	2557	73 16 21	2548	71 36 15	2540
14	α Pegasi W.	94 37 28	2800	96 11 56	2795	97 46 31	2790	99 21 12	2785
	α Arietis W.	51 2 36	2730	52 38 36	2713	54 14 59	2696	55 51 44	2681
	Aldebaran W.	16 55 4	2503	18 36 13	2495	20 17 33	2487	21 59 4	2480
	Regulus E.	63 13 0	2502	61 31 49	2494	59 50 28	2487	58 8 57	2480
15	α Arietis W.	64 0 12	2617	65 38 44	2607	67 17 30	2596	68 56 30	2586
	Aldebaran W.	30 29 5	2447	32 11 33	2441	33 54 10	2434	35 36 56	2428
	Regulus E.	49 38 57	2447	47 56 29	2441	46 13 53	2435	44 31 8	2429
	Spica E.	103 17 10	2470	101 35 15	2463	99 53 10	2457	98 10 56	2450
	SUN E	134 9 53	2811	132 35 39	2802	131 1 14	2795	129 26 39	2787
16	α Arietis W.	77 14 39	2545	78 54 50	2538	80 35 11	2530	82 15 42	2524
	Aldebaran W.	44 12 53	2399	45 56 29	2394	47 40 12	2389	49 24 3	2383
	Regulus E.	35 55 19	2401	34 11 45	2396	32 28 4	2390	30 44 15	2385
	Spica E.	89 37 37	2422	87 54 33	2416	86 11 21	2411	84 28 2	2406
	JUPITER E.	91 53 46	2468	90 11 48	2462	88 29 42	2458	86 47 29	2452
	SUN E.	121 31 18	2751	119 55 46	2745	118 20 6	2739	116 44 18	2732
17	α Arietis W.	90 40 19	2497	92 21 36	2493	94 2 59	2489	95 44 28	2485
	Aldebaran W.	58 5 12	2358	59 49 47	2353	61 34 29	2348	63 19 18	2344
	Spica E.	75 49 41	2389	74 5 41	2378	72 21 34	2373	70 37 21	2369
	JUPITER E.	78 14 30	2426	76 31 33	2422	74 48 29	2417	73 5 18	2412
	SUN E.	108 43 14	2704	107 6 39	2698	105 29 56	2692	103 53 6	2688

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Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
9	Pollux	E.	85° 38′ 1″	2909	84° 5′ 54″	2899	82° 33′ 34″	2890	81° 1′ 2″	2880
	Saturn	E.	85 57 26	2844	84 23 55	2833	82 50 10	2823	81 16 12	2812
10	Fomalhaut	W.	66 48 7	3119	68 15 53	3101	69 44 1	3083	71 12 31	3066
	α Pegasi	W.	52 15 6	3240	53 40 28	3210	55 6 25	3182	56 32 56	3156
	Aldebaran	E.	28 58 48	2759	27 23 26	2748	25 47 50	2738	24 12 0	2728
	Pollux	E.	73 15 14	2832	71 41 28	2823	70 7 30	2814	68 33 20	2805
	Saturn	E.	73 22 57	2760	71 47 37	2750	70 12 3	2740	68 36 16	2729
11	Fomalhaut	W.	78 39 57	2991	80 10 21	2978	81 41 1	2966	83 11 56	2954
	α Pegasi	W.	63 52 56	3043	65 22 16	3024	66 51 59	3005	68 22 5	2988
	Saturn	E.	60 33 56	2679	58 56 48	2669	57 19 27	2660	55 41 53	2651
	Pollux	E.	60 39 49	2766	59 4 37	2760	57 29 16	2753	55 53 46	2747
	Regulus	E.	96 16 28	2677	94 39 17	2666	93 1 52	2657	91 24 14	2647
12	Fomalhaut	W.	90 50 2	2904	92 22 16	2895	93 54 41	2887	95 27 16	2880
	α Pegasi	W.	75 57 43	2912	77 29 46	2900	79 2 5	2887	80 34 40	2876
	α Arietis	W.	32 33 39	3098	34 1 51	3048	35 31 4	3004	37 1 12	2964
	Saturn	E.	47 30 57	2606	45 52 10	2597	44 13 11	2589	42 34 1	2582
	Pollux	E.	47 54 33	2796	46 18 28	2794	44 42 20	2793	43 6 11	2793
	Regulus	E.	83 12 50	2600	81 33 55	2591	79 54 48	2583	78 15 29	2574
13	Fomalhaut	W.	103 12 10	2855	104 45 27	2852	106 18 47	2850	107 52 10	2849
	α Pegasi	W.	88 21 1	2828	89 54 53	2819	91 28 56	2812	93 3 8	2806
	α Arietis	W.	44 43 0	2813	46 17 11	2790	47 51 52	2769	49 27 1	2749
	Saturn	E.	34 15 36	2545	32 35 26	2540	30 55 8	2535	29 14 43	2530
	Pollux	E.	35 6 10	2750	33 30 36	2761	31 55 17	2777	30 20 19	2797
	Regulus	E.	69 55 58	2533	68 15 30	2525	66 34 51	2517	64 54 1	2509
14	α Pegasi	W.	100 55 59	2782	102 30 50	2780	104 5 44	2778	105 40 41	2777
	α Arietis	W.	57 28 49	2667	59 6 13	2653	60 43 56	2640	62 21 56	2629
	Aldebaran	W.	23 40 45	2473	25 22 36	2467	27 4 36	2460	28 46 46	2453
	Regulus	E.	56 27 16	2473	54 45 25	2467	53 3 25	2460	51 21 16	2453
15	α Arietis	W.	70 35 44	2577	72 15 10	2569	73 54 48	2560	75 34 38	2552
	Aldebaran	W.	37 19 51	2422	39 2 54	2417	40 46 5	2410	42 29 25	2405
	Regulus	E.	42 48 15	2423	41 5 13	2417	39 22 3	2412	37 38 45	2406
	Spica	E.	96 28 33	2444	94 46 1	2438	93 3 21	2433	91 20 33	2427
	Sun	E.	127 51 54	2779	126 16 59	2772	124 41 55	2765	123 6 41	2758
16	α Arietis	W.	83 56 22	2518	85 37 10	2512	87 18 6	2507	88 59 9	2502
	Aldebaran	W.	51 8 2	2378	52 52 9	2373	54 36 23	2368	56 20 44	2363
	Regulus	E.	29 0 19	2380	27 16 16	2375	25 32 6	2371	23 47 49	2366
	Spica	E.	82 44 36	2401	81 1 2	2396	79 17 22	2391	77 33 35	2387
	Jupiter	E.	85 5 8	2446	83 22 39	2441	81 40 3	2436	79 57 20	2431
	Sun	E.	115 8 21	2726	113 32 16	2720	111 56 3	2714	110 19 42	2709
17	α Arietis	W.	97 26 3	2482	99 7 42	2478	100 49 26	2476	102 31 13	2474
	Aldebaran	W.	65 4 13	2339	66 49 15	2335	68 34 24	2331	70 19 39	2326
	Spica	E.	68 53 2	2366	67 8 38	2362	65 24 8	2358	63 39 33	2355
	Jupiter	E.	71 22 1	2408	69 38 37	2403	67 55 7	2399	66 11 31	2395
	Sun	E.	102 16 10	2683	100 39 7	2678	99 1 57	2672	97 24 40	2668

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Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
18	Aldebaran	W.	72° 5′ 1″	2322	73° 50′ 29″	2318	75° 36′ 2″	2314	77° 21′ 41″	2310
	Pollux	W.	29 39 20	2593	31 18 24	2563	32 58 10	2537	34 38 32	2514
	SATURN	W.	28 0 5	2340	29 45 6	2333	31 30 17	2326	33 15 38	2320
	Spica	E.	61 54 54	2352	60 10 10	2348	58 25 21	2345	56 40 27	2342
	JUPITER	E.	64 27 49	2391	62 44 1	2387	61 0 7	2383	59 16 8	2379
	SUN	E.	95 47 17	2663	94 9 47	2659	92 32 12	2655	90 54 31	2650
19	Aldebaran	W.	86 11 22	2291	87 57 34	2288	89 43 51	2285	91 30 13	2282
	Pollux	W.	43 7 18	2432	44 50 7	2420	46 33 13	2410	48 16 34	2400
	SATURN	W.	42 4 22	2296	43 50 28	2291	45 36 40	2287	47 22 58	2284
	Spica	E.	47 55 10	2334	46 10 0	2333	44 24 49	2333	42 39 37	2333
	JUPITER	E.	50 34 53	2362	48 50 24	2359	47 5 51	2357	45 21 14	2354
	SUN	E.	82 44 43	2631	81 6 30	2626	79 28 13	2024	77 49 51	2621
20	Pollux	W.	56 56 27	2362	58 40 56	2357	60 25 33	2352	62 10 17	2348
	SATURN	W.	56 15 43	2268	58 2 30	2266	59 49 20	2264	61 36 13	2262
	Regulus	W.	20 16 43	2273	22 3 22	2270	23 50 5	2268	25 36 51	2266
	Spica	E.	33 54 6	2346	32 9 14	2352	30 24 30	2359	28 39 57	2369
	JUPITER	E.	36 37 21	2345	34 52 27	2345	33 7 33	2345	31 22 39	2346
	SUN	E.	69 37 6	2609	67 58 23	2607	66 19 38	2606	64 40 51	2605
21	Pollux	W.	70 55 20	2332	72 40 33	2331	74 25 48	2329	76 11 5	2328
	SATURN	W.	70 31 16	2256	72 18 21	2255	74 5 27	2254	75 52 34	2254
	Regulus	W.	34 31 22	2260	36 18 20	2260	38 5 19	2259	39 52 19	2260
	SUN	E.	56 26 41	2604	54 47 51	2604	53 9 2	2605	51 30 14	2606
22	Pollux	W.	84 57 37	2331	86 42 52	2333	88 28 4	2335	90 13 12	2338
	SATURN	W.	84 47 56	2260	86 34 55	2262	88 21 51	2264	90 8 43	2267
	Regulus	W.	48 47 3	2265	50 33 54	2267	52 20 42	2269	54 7 27	2272
	SUN	E.	43 16 58	2622	41 38 33	2626	40 0 14	2632	38 22 3	2638
23	Pollux	W.	98 57 40	2359	100 42 13	2365	102 26 38	2371	104 10 55	2377
	Regulus	W.	62 59 57	2291	64 46 10	2296	66 32 16	2302	68 18 13	2308
	SUN	E.	30 13 37	2684	28 36 35	2696	26 59 50	2712	25 23 26	2730
27	SUN	W.	21 36 58	3082	23 5 30	3082	24 34 1	3087	26 2 27	3093
	Fomalhaut	E.	69 27 22	2963	67 56 23	2985	66 25 51	3008	64 55 48	3031
	α Pegasi	E.	84 17 19	2917	82 45 22	2934	81 13 46	2950	79 42 31	2968
28	SUN	W.	33 22 16	3139	34 49 38	3151	36 16 46	3163	37 43 40	3174
	Fomalhaut	E.	57 33 17	3167	56 6 28	3198	54 40 16	3230	53 14 42	3264
	α Pegasi	E.	72 11 55	3063	70 43 0	3083	69 14 30	3105	67 46 26	3126
29	SUN	W.	44 54 31	3236	46 19 57	3249	47 45 8	3261	49 10 5	3274
	Fomalhaut	E.	46 17 28	3464	44 56 24	3512	43 36 13	3565	42 17 0	3620
	α Pegasi	E.	60 32 57	3247	59 7 43	3273	57 43 0	3300	56 18 49	3330
	α Arietis	E.	103 12 45	2981	101 42 9	2993	100 11 48	3005	98 41 41	3016
30	SUN	W.	56 11 17	3332	57 34 51	3343	58 58 13	3353	60 21 23	3364
	Fomalhaut	E.	35 57 29	3981	34 45 31	4076	33 35 6	4182	32 26 23	4301
	α Pegasi	E.	49 26 40	3494	48 6 9	3533	46 46 21	3573	45 27 17	3616
	α Arietis	E.	91 14 33	3071	89 45 48	3082	88 17 16	3092	86 48 57	3102

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
18	Aldebaran	W.	79° 7′ 26″	2306	80° 53′ 17″	2302	82° 39′ 13″	2298	84° 25′ 15″	2295
	Pollux	W.	36 19 26	2494	38 0 48	2475	39 42 36	2459	41 24 47	2445
	Saturn	W.	35 1 8	2315	36 46 46	2310	38 32 31	2305	40 18 23	2300
	Spica	E.	54 55 29	2340	53 10 28	2338	51 25 24	2337	49 40 18	2335
	Jupiter	E.	57 32 3	2375	55 47 53	2372	54 3 38	2368	52 19 18	2365
	Sun	E.	89 16 44	2646	87 38 52	2642	86 0 54	2638	84 22 51	2635
19	Aldebaran	W.	93 16 39	2279	95 3 9	2277	96 49 43	2274	98 36 21	2271
	Pollux	W.	50 0 9	2391	51 43 57	2382	53 27 57	2375	55 12 7	2368
	Saturn	W.	49 9 21	2281	50 55 49	2277	52 42 22	2274	54 29 0	2270
	Spica	E.	40 54 26	2334	39 9 16	2336	37 24 9	2338	35 39 5	2342
	Jupiter	E.	43 36 33	2352	41 51 49	2350	40 7 2	2348	38 22 13	2346
	Sun	E.	76 11 25	2618	74 32 55	2616	72 54 22	2614	71 15 46	2611
20	Pollux	W.	63 55 7	2344	65 40 3	2340	67 25 4	2337	69 10 10	2334
	Saturn	W.	63 23 9	2260	65 10 8	2258	66 57 9	2257	68 44 12	2256
	Regulus	W.	27 23 41	2264	29 10 34	2262	30 57 29	2262	32 44 25	2261
	Spica	E.	26 55 38	2382	25 11 37	2397	23 27 58	2417	21 44 48	2444
	Jupiter	E.	29 37 46	2346	27 52 54	2348	26 8 4	2350	24 23 17	2353
	Sun	E.	63 2 3	2604	61 23 13	2603	59 44 22	2603	58 5 31	2604
21	Pollux	W.	77 56 24	2328	79 41 43	2328	81 27 2	2328	83 12 20	2329
	Saturn	W.	77 39 41	2255	79 26 47	2256	81 13 52	2257	83 0 55	2258
	Regulus	W.	41 39 18	2260	43 26 16	2261	45 13 13	2262	47 0 9	2263
	Sun	E.	49 51 27	2608	48 12 43	2611	46 34 3	2615	44 55 28	2618
22	Pollux	W.	91 58 16	2341	93 43. 16	2344	95 28 11	2349	97 12 59	2354
	Saturn	W.	91 55 31	2270	93 42 14	2274	95 28 52	2277	97 15 25	2281
	Regulus	W.	55 54 7	2276	57 40 42	2279	59 27 12	2283	61 13 37	2286
	Sun	E.	36 44 0	2646	35 6 7	2654	33 28 25	2662	31 50 54	2672
23	Pollux	W.	105 55 3	2384	107 39 0	2393	109 22 45	2401	111 6 18	2410
	Regulus	W.	70 4 1	2314	71 49 40	2320	73 35 10	2326	75 20 31	2333
	Sun	E.	23 47 26	2750	22 11 52	2772	20 36 48	2800	19 2 21	2835
27	Sun	W.	27 30 45	3101	28 58 54	3109	30 26 53	3118	31 54 41	3129
	Fomalhaut	E.	63 2[illegible] 14	3056	61 57 11	3082	60 28 40	3110	59 0 42	3137
	α Pegasi	E.	78 11 38	2985	76 41 7	3004	75 10 59	3023	73 41 15	3043
28	Sun	W.	39 10 20	3187	40 36 45	3199	42 2 55	3212	43 28 50	3224
	Fomalhaut	E.	51 49 48	3299	50 25 35	3337	49 2 6	3377	47 39 23	3419
	α Pegasi	E.	66 18 48	3149	64 51 38	3172	63 24 55	3196	61 58 41	3221
29	Sun	W.	50 34 47	3286	51 59 15	3298	53 23 29	3309	54 47 30	3321
	Fomalhaut	E.	40 58 47	3679	39 41 38	3746	38 25 39	3817	37 10 54	3895
	α Pegasi	E.	54 55 12	3359	53 32 9	3391	52 9 42	3423	50 47 52	3457
	α Arietis	E.	97 11 48	3027	95 42 9	3038	94 12 43	3049	92 43 31	3060
30	Sun	W.	61 44 21	3374	63 7 7	3382	64 29 43	3393	65 52 8	3401
	Fomalhaut	E.	31 19 31	4434	30 14 40	4585	29 12 2	4757	28 11 50	4954
	α Pegasi	E.	44 9 0	3663	42 51 34	3713	41 35 1	3767	40 19 24	3825
	α Arietis	E.	85 20 50	3113	83 52 56	3124	82 25 15	3133	80 57 45	3143

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Wed.	1	16 30 17.71	10.806	S. 21 51 2.5	−23.11	16 15.97	70.32	10 44.27	0.948
Thur.	2	16 34 37.38	10.831	22 0 4.6	22.05	16 16.12	70.40	10 21.23	0.973
Frid.	3	16 38 57.64	10.856	22 8 41.1	20.99	16 16.27	70.48	9 57.59	0.997
Sat.	4	16 43 18.48	10.880	22 16 52.0	−19.91	16 16.41	70.56	9 33.37	1.021
SUN.	5	16 47 39.87	10.902	22 24 36.9	18.82	16 16.55	70.64	9 8.60	1.043
Mon.	6	16 52 1.78	10.923	22 31 55.5	17.72	16 16.68	70.71	8 43.31	1.064
Tues.	7	16 56 24.18	10.943	22 38 47.7	−16.61	16 16.81	70.78	8 17.54	1.084
Wed.	8	17 0 47.07	10.963	22 45 13.1	15.50	16 16.93	70.84	7 51.27	1.104
Thur.	9	17 5 10.42	10.981	22 51 11.7	14.38	16 17.05	70.90	7 24.56	1.122
Frid.	10	17 9 34.18	10.998	22 56 43.2	−13.25	16 17.17	70.96	6 57.43	1.139
Sat.	11	17 13 58.35	11.014	23 1 47.5	12.11	16 17.27	71.01	6 29.90	1.155
SUN.	12	17 18 22.90	11.029	23 6 24.3	10.96	16 17.37	71.06	6 1.98	1.170
Mon.	13	17 22 47.80	11.043	23 10 33.6	− 9.81	16 17.47	71.11	5 33 71	1.184
Tues.	14	17 27 13.02	11.056	23 14 15.2	8.66	16 17.56	71.15	5 5.12	1.197
Wed.	15	17 31 38 53	11.067	23 17 29.1	7.50	16 17.64	71.18	4 36.25	1.208
Thur.	16	17 36 4.31	11.078	23 20 15.0	− 6.33	16 17.72	71.21	4 7.11	1.219
Frid.	17	17 40 30.33	11.087	23 22 32.9	5.16	16 17.79	71.23	3 37.73	1.228
Sat.	18	17 44 56.54	11.096	23 24 22.7	3.98	16 17.86	71.25	3 8.15	1.236
SUN.	19	17 49 22.92	11.102	23 25 44.3	− 2.81	16 17.92	71.27	2 38.41	1.242
Mon.	20	17 53 49.43	11.107	23 26 37.6	1.63	16 17.98	71.28	2 8.54	1.247
Tues.	21	17 58 16.04	11.110	23 27 2.8	− 0.45	16 18.03	71.29	1 38.57	1.250
Wed.	22	18 2 42.71	11.112	23 26 59.7	+ 0.73	16 18.08	71.29	0 8.54	1.252
Thur.	23	16 7 9.40	11.112	23 26 28.2	1.91	16 18.13	71.29	0 38.49	1.252
Frid.	24	18 11 36.08	11.111	23 25 28.4	3.08	16 18.17	71.28	0 8.45	1.251
								Added to Apparent Time.	
Sat.	25	18 16 2.70	11.108	23 24 0.4	+ 4.26	16 18.21	71.27	0 21.53	1.248
SUN.	26	18 20 29.24	11.103	23 22 4.2	5.43	16 18.24	71.26	0 51.43	1.243
Mon.	27	18 24 55.65	11.097	23 19 39.8	6.60	16 18.27	71.24	1 21.20	1.237
Tues.	28	18 29 21.88	11.089	23 16 47.2	+ 7.77	16 18.30	71.22	1 50.79	1.229
Wed.	29	18 33 47.90	11.080	23 13 26.6	8.93	16 18.32	71.19	2 20.17	1.220
Thur.	30	18 38 13.68	11.069	23 9 38.1	10.09	16 18.34	71.16	2 49.31	1.209
Frid.	31	18 42 39.17	11.057	23 5 21.8	11.25	16 18.35	71.12	3 18.17	1.196
Sat.	32	18 47 4.34	11.043	S. 23 0 37.7	+12.41	16 18.36	71.08	3 46.72	1.182

NOTE.—The mean time of semidiameter passing may be found by subtracting 0^{s}.19 from the sidereal time.
The sign − prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Added to / Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Wed.	1	16 30 19.65	10.804	S. 21 51 6.6	-23.10	10 44.10	0.948	16 41 3.75
Thur.	2	16 34 39.25	10.829	22 0 8.4	22.04	10 21.06	0.973	16 45 0.30
Frid.	3	16 38 59.44	10.853	22 8 44.6	20.98	9 57.42	0.997	16 48 56.86
Sat.	4	16 43 20.21	10.877	22 16 55.2	-19.90	9 33.20	1.021	16 52 53.41
SUN.	5	16 47 41.53	10.899	22 24 39.8	18.81	9 8.44	1.043	16 56 49.97
Mon.	6	16 52 3.37	10.920	22 31 58.1	17.71	8 43.16	1.064	17 0 46.53
Tues.	7	16 56 25.70	10.940	22 38 50.0	-16.60	8 17.39	1.084	17 4 43.09
Wed.	8	17 0 48.51	10.960	22 45 15.2	15.49	7 51.13	1 104	17 8 39.64
Thur.	9	17 5 11.78	10.978	22 51 13.5	14.37	7 24.42	1.122	17 12 36.20
Frid.	10	17 9 35.46	10.995	22 56 44.8	-13.24	6 57.30	1.139	17 16 32.76
Sat.	11	17 13 59.55	11.011	23 1 48.9	12.10	6 29.77	1.155	17 20 29.32
SUN.	12	17 18 24.01	11.026	23 6 25.5	10.95	6 1.86	1.170	17 24 25.87
Mon.	13	17 22 48.83	11.040	23 10 34.6	- 9.80	5 33.60	1.184	17 28 22.43
Tues.	14	17 27 13.96	11.053	23 14 16.0	8.65	5 5.02	1.197	17 32 18.98
Wed.	15	17 31 39.38	11.064	23 17 29.7	7.49	4 36.16	1.208	17 36 15.54
Thur.	16	17 36 5.07	11.075	23 20 15.5	- 6.32	4 7.03	1.219	17 40 12.10
Frid.	17	17 40 31.00	11.084	23 22 33.2	5.15	3 37.66	1.228	17 44 8.66
Sat.	18	17 44 57.12	11.092	23 24 22.9	3.98	3 8.09	1.236	17 48 5.21
SUN.	19	17 49 23.41	11.098	23 25 44.4	- 2.81	2 38.36	1.242	17 52 1.77
Mon.	20	17 53 49.83	11.103	23 26 37.7	1.63	2 8.50	1.247	17 55 58.33
Tues.	21	17 58 16.34	11.106	23 27 2.8	- 0.45	1 38.55	1.250	17 59 54.89
Wed.	22	18 2 42.92	11.108	23 26 59.7	+ 0.73	1 8.52	1.252	18 3 51.44
Thur.	23	18 7 9.52	11.108	23 26 28.2	1.91	0 38.48	1.252	18 7 48.00
Frid.	24	18 11 36.11	11.107	23 25 28.4	3.08	0 8.45	1.251	18 11 44.56
Sat.	25	18 16 2.64	11.104	23 24 0.5	+ 4.26	0 21.52	1.248	18 15 41.12
SUN.	26	18 20 29.08	11.099	23 22 4.3	5.43	0 51.41	1.243	18 19 37.67
Mon.	27	18 24 55.40	11.093	23 19 40.0	6.60	1 21.17	1.237	18 23 34.23
Tues.	28	18 29 21.54	11.085	23 16 47.5	+ 7.77	1 50.75	1.229	18 27 30.79
Wed.	29	18 33 47.47	11.076	23 13 27.0	8.93	2 20.12	1.220	18 31 27.35
Thur.	30	18 38 13.16	11.065	23 9 38.6	10.09	2 49.26	1.209	18 35 23.90
Frid.	31	18 42 38.56	11.053	23 5 22.4	11.25	3 18.10	1.196	18 39 20.46
Sat.	32	18 47 3.65	11.039	S. 23 0 38.5	+12.40	3 46.64	1.182	18 43 17.01

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign -- prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

Diff. for 1 Hour, $+\,9^{s}.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					h m s
1	335	249° 16′ 33″.5	15′ 56″.5	152″.18	+ 0″.28	9.9937430	− 28.8	7 17 44.35
2	336	250 17 26.2	16 49.0	152.21	0.14	9.9936746	28.1	7 13 48.44
3	337	251 18 19.7	17 42.5	152.24	+ 0.01	9.9936081	27.3	7 9 52.53
4	338	252 19 13.9	18 36.5	152.27	− 0.12	9.9935435	− 26.5	7 5 56.62
5	339	253 20 8.8	19 31.2	152.30	0.25	9.9934810	25.6	7 2 0.70
6	340	254 21 4.5	20 26.7	152.33	0.36	9.9934207	24.6	6 58 4.79
7	341	255 22 0.9	21 23.0	152.36	− 0.43	9.9933628	− 23.6	6 54 8.88
8	342	256 22 58.1	22 20.0	152.40	0.48	9.9933074	22.6	6 50 12.97
9	343	257 23 55.9	23 17.7	152.43	0.50	9.9932545	21.5	6 46 17.06
10	344	258 24 54.5	24 16.1	152.46	− 0.50	9.9932042	− 20.4	6 42 21.15
11	345	259 25 53.9	25 15.3	152.49	0.46	9.9931566	19.3	6 38 25.24
12	346	260 26 54.1	26 15.3	152.52	0.38	9.9931118	18.1	6 34 29.33
13	347	261 27 55.1	27 16.2	152.55	− 0.29	9.9930697	− 17.0	6 30 33.42
14	348	262 28 57.0	28 17.9	152.59	0.19	9.9930302	16.0	6 26 37.51
15	349	263 29 59.8	29 20.5	152.63	− 0.07	9.9929931	14.9	6 22 41.60
16	350	264 31 3.5	30 24.0	152.66	+ 0.07	9.9929585	− 13.9	6 18 45.69
17	351	265 32 8.1	31 28.5	152.70	0.21	9.9929264	12.9	6 14 49.77
18	352	266 33 13.5	32 33.8	152.73	0.32	9.9928967	11.9	6 10 53.86
19	353	267 34 19.7	33 39.8	152.77	+ 0.42	9.9928692	− 11.0	6 6 57.94
20	354	268 35 26.7	34 46.6	152.80	0.51	9.9928437	10.2	6 3 2.03
21	355	269 36 34.4	35 54.1	152.83	0.57	9.9928201	9.4	5 59 6.12
22	356	270 37 42.8	37 2.4	152.86	+ 0.60	9.9927984	− 8.7	5 55 10.21
23	357	271 38 51.8	38 11.3	152.88	0.60	9.9927784	8.0	5 51 14.30
24	358	272 40 1.3	39 20.6	152.90	0.56	9.9927601	7.3	5 47 18.39
25	359	273 41 11.2	40 30.3	152.91	+ 0.50	9.9927435	− 6.6	5 43 22.48
26	360	274 42 21.4	41 40.3	152.92	0.42	9.9927285	5.9	5 39 26.57
27	361	275 43 31.7	42 50.5	152.92	0.31	9.9927152	5.2	5 35 30.65
28	362	276 44 42.1	44 0.8	152.92	+ 0.18	9.9927036	− 4.5	5 31 34.74
29	363	277 45 52.5	45 11.0	152.92	+ 0.04	9.9926936	3.8	5 27 38.83
30	364	278 47 2.8	46 21.1	152.92	− 0.10	9.9926854	3.0	5 23 42.91
31	365	279 48 13.0	47 31.1	152.92	0.23	9.9926792	2.2	5 19 47.00
32	366	280 49 23.0	48 41.0	152.91	− 0.36	9.9926751	− 1.5	5 15 51.09

Note.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January $0^d.0$.

Diff. for 1 Hour,
— $9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 55.0	14 52.4	54 37.9	-0.90	54 28.3	-0.70	4 41.8	1.90	5.7
2	14 50.4	14 49.2	54 21.0	0.50	54 16.4	-0.28	5 26.6	1.83	6.7
3	14 48.6	14 48.8	54 14.4	-0.05	54 15.1	+0.16	6 9.8	1.78	7.7
4	14 49.7	14 51.3	54 18.3	+0.38	54 24.2	+0.60	6 52.4	1.77	8.7
5	14 53.6	14 56.5	54 32.6	0.80	54 43.4	0.99	7 34.9	1:78	9.7
6	15 0.0	15 4.1	54 56.3	1.16	55 11.3	1.32	8 18.2	1.83	10.7
7	15 8.7	15 13.6	55 28.0	+1.45	55 46.1	+1.56	9 3.1	1.91	11.7
8	15 18.8	15 24.3	56 5.4	1.64	56 25.5	1.69	9 50.2	2.02	12.7
9	15 29.9	15 35.5	56 45.9	1.71	57 6.4	1.69	10 40.2	2.15	13.7
10	15 40.9	15 46.2	57 26.4	+1.64	57 45.7	+1.56	11 33.1	2.27	14.7
11	15 51.1	15 55.7	58 3.9	1.46	58 20.7	1.33	12 28.7	2.36	15.7
12	15 59.8	16 3.3	58 35.7	1.17	58 48.8	1.01	13 26.1	2.41	16.7
13	16 6.4	16 8.8	58 59.9	+0.84	59 8.8	+0.65	14 23.8	2.40	17.7
14	16 10.6	16 11.9	59 15.6	0.48	59 20.2	+0.30	15 20.8	2.34	18.7
15	16 12.6	16 12.9	59 22.9	+0.15	59 23.7	0.00	16 16.1	2.27	19.7
16	16 12.6	16 12.0	59 22.9	-0.13	59 20.5	-0.25	17 9.6	2.19	20.7
17	16 11.0	16 9.6	59 16.8	0.36	59 11.8	0.45	18 1.6	2.14	21.7
18	16 8.0	16 6.1	59 5.9	0.53	58 59.0	0.61	18 52.5	2.11	22.7
19	16 4.0	16 1.7	58 51.2	-0.68	58 42.6	-0.75	19 43.2	2.11	23.7
20	15 59.1	15 56.3	58 33.2	0.82	58 23.0	0.88	20 34.1	2.14	24.7
21	15 53.4	15 50.1	58 12.1	0.95	58 0.3	1.01	21 25.9	2.18	25.7
22	15 46.7	15 43.1	57 47.8	-1.07	57 34.6	-1.14	22 18.4	2.21	26.7
23	15 39.3	15 35.3	57 20.5	1.20	57 5.9	1.24	23 11.5	2.21	27.7
24	15 31.2	15 26.9	56 50.7	1.29	56 35.0	1.32	6		28.7
25	15 22.6	15 18.2	56 19.1	-1.33	56 3.1	-1.33	0 4.4	2.19	0.1
26	15 13.9	15 9.7	55 47.3	1.30	55 31.9	1.26	0 56.3	2.13	1.1
27	15 5.7	15 1.9	55 17.1	1.20	55 3.1	1.11	1 46.5	2.05	2.1
28	14 58.4	14 55.3	54 50.4	-1 00	54 39.0	-0.88	2 34.6	1.96	3.1
29	14 52.7	14 50.5	54 29.2	0.74	54 21.3	0.58	3 20.6	1.87	4.1
30	14 48.9	14 47.9	54 15.4	-0.40	54 11.7	-0.21	4 4.7	1.80	5.1
31	14 47.5	14 47.9	54 10.4	0.00	54 11.6	+0.20	4 47.4	1.76	6.1
32	14 48.9	14 50.6	54 15.3	+0.42	54 21.7	+0.64	5 29.6	1.75	7.1

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 14 11.48	2.0222	S. 14 37 35.1	6.499
1	21 16 12.72	2.0190	14 31 3.3	6.560
2	21 18 13.76	2.0157	14 24 27.9	6.620
3	21 20 14.61	2.0126	14 17 48.9	6.679
4	21 22 15.27	2.0095	14 11 6.4	6.738
5	21 24 15.75	2.0064	14 4 20.3	6.797
6	21 26 16.04	2.0033	13 57 30.7	6.855
7	21 28 16.14	2.0002	13 50 37.7	6.912
8	21 30 16.06	1.9972	13 43 41.3	6.969
9	21 32 15.80	1.9941	13 36 41.4	7.026
10	21 34 15.35	1.9911	13 29 38.2	7.081
11	21 36 14.73	1.9882	13 22 31.7	7.136
12	21 38 13.93	1.9852	13 15 21.9	7.190
13	21 40 12.96	1.9823	13 8 8.9	7.243
14	21 42 11.81	1.9794	13 0 52.7	7.296
15	21 44 10.49	1.9766	12 53 33.3	7.349
16	21 46 9.00	1.9738	12 46 10.8	7.401
17	21 48 7.35	1.9711	12 38 45.2	7.452
18	21 50 5.53	1.9684	12 31 16.6	7.502
19	21 52 3.55	1.9657	12 23 45.0	7.553
20	21 54 1.41	1.9630	12 16 10.3	7.603
21	21 55 59.11	1.9603	12 8 32.6	7.652
22	21 57 56.65	1.9577	12 0 52.0	7.700
23	21 59 54.04	1.9552	S. 11 53 8.6	7.747

THURSDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 1 51.27	1.9526	S. 11 45 22.3	7.795
1	22 3 48.35	1.9502	11 37 33.2	7.842
2	22 5 45.29	1.9478	11 29 41.3	7.888
3	22 7 42.08	1.9453	11 21 46.6	7.934
4	22 9 38.72	1.9429	11 13 49.2	7.979
5	22 11 35.23	1.9406	11 5 49.1	8.023
6	22 13 31.60	1.9383	10 57 46.4	8.067
7	22 15 27.83	1.9361	10 49 41.1	8.110
8	22 17 23.93	1.9338	10 41 33.2	8.153
9	22 19 19.89	1.9316	10 33 22.7	8.196
10	22 21 15.72	1.9295	10 25 9.7	8.238
11	22 23 11.43	1.9274	10 16 54.2	8.279
12	22 25 7.01	1.9253	10 8 36.2	8.320
13	22 27 2.47	1.9233	10 0 15.8	8.360
14	22 28 57.81	1.9213	9 51 53.0	8.399
15	22 30 53.03	1.9194	9 43 27.9	8.438
16	22 32 48.14	1.9176	9 35 0.4	8.476
17	22 34 43.14	1.9157	9 26 30.7	8.514
18	22 36 38.03	1.9139	9 17 58.7	8.552
19	22 38 32.81	1.9122	9 9 24.4	8.590
20	22 40 27.49	1.9104	9 0 47.9	8.626
21	22 42 22.06	1.9087	8 52 9.3	8.662
22	22 44 16.54	1.9071	8 43 28.5	8.697
23	22 46 10.92	1.9056	8 34 45.6	8.732
24	22 48 5.21	1.9041	S. 8 26 0.7	8.766

FRIDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 48 5.21	1.9041	S. 8 26 0.7	8.766
1	22 49 59.41	1.9026	8 17 13.7	8.800
2	22 51 53.52	1.9011	8 8 24.7	8.833
3	22 53 47.54	1.8997	7 59 33.7	8.866
4	22 55 41.48	1.8984	7 50 40.8	8.899
5	22 57 35.34	1.8971	7 41 45.9	8.931
6	22 59 29.13	1.8958	7 32 49.1	8.962
7	23 1 22.84	1.8946	7 23 50.5	8.992
8	23 3 16.48	1.8934	7 14 50.1	9.022
9	23 5 10.05	1.8923	7 5 47.8	9.052
10	23 7 3.55	1.8912	6 56 43.8	9.082
11	23 8 56.99	1.8902	6 47 38.0	9.111
12	23 10 50.37	1.8892	6 38 30.5	9.138
13	23 12 43.69	1.8882	6 29 21.4	9.166
14	23 14 36.96	1.8874	6 20 10.6	9.193
15	23 16 30.18	1.8866	6 10 58.2	9.220
16	23 18 23.35	1.8858	6 1 44.2	9.246
17	23 20 16.48	1.8851	5 52 28.7	9.272
18	23 22 9.56	1.8844	5 43 11.6	9.297
19	23 24 2.60	1.8838	5 33 53.0	9.322
20	23 25 55.61	1.8832	5 24 33.0	9.345
21	23 27 48.58	1.8826	5 15 11.6	9.368
22	23 29 41.52	1.8821	5 5 48.8	9.392
23	23 31 34.44	1.8817	S. 4 56 24.6	9.415

SATURDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 33 27.33	1.8813	S. 4 46 59.0	9.437
1	23 35 20.20	1.8810	4 37 32.1	9.458
2	23 37 13.05	1.8807	4 28 4.0	9.479
3	23 39 5.88	1.8804	4 18 34.6	9.500
4	23 40 58.70	1.8802	4 9 4.0	9.520
5	23 42 51.51	1.8801	3 59 32.2	9.540
6	23 44 44.31	1.8800	3 49 59.2	9.559
7	23 46 37.11	1.8800	3 40 25.1	9.577
8	23 48 29.91	1.8800	3 30 49.9	9.595
9	23 50 22.71	1.8801	3 21 13.7	9.613
10	23 52 15.52	1.8802	3 11 36.4	9.630
11	23 54 8.33	1.8803	3 1 58.1	9.646
12	23 56 1.15	1.8805	2 52 18.9	9.661
13	23 57 53.99	1.8808	2 42 38.8	9.677
14	23 59 46.85	1.8811	2 32 57.7	9.692
15	0 1 39.72	1.8814	2 23 15.7	9.707
16	0 3 32.62	1.8819	2 13 32.8	9.721
17	0 5 25.55	1.8824	2 3 49.2	9.734
18	0 7 18.51	1.8829	1 54 4.8	9.746
19	0 9 11.50	1.8835	1 44 19.7	9.759
20	0 11 4.53	1.8841	1 34 33.8	9.771
21	0 12 57.59	1.8848	1 24 47.2	9.782
22	0 14 50.70	1.8856	1 15 0.0	9.793
23	0 16 43.86	1.8863	1 5 12.1	9.803
24	0 18 37.06	1.8871	S. 0 55 23.6	9.812

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 5.					**TUESDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 18 37.06	1.8871	S. 0 55 23.6	9.812	0	1 51 8.19	1.9871	N. 6 55 30.9	9.564
1	0 20 30.31	1.8880	0 45 34.6	9.821	1	1 53 7.51	1.9903	7 5 4.1	9.542
2	0 22 23.62	1.8890	0 35 45.1	9.830	2	1 55 7.03	1.9937	7 14 36.0	9.520
3	0 24 16.99	1.8900	0 25 55.0	9.838	3	1 57 6.75	1.9970	7 24 6.5	9.496
4	0 26 10.42	1.8910	0 16 4.5	9.845	4	1 59 6.67	2.0004	7 33 35.5	9.472
5	0 28 3.91	1.8921	S. 0 6 13.6	9.852	5	2 1 6.80	2.0038	7 43 3.1	9.447
6	0 29 57.47	1.8932	N. 0 3 37.7	9.858	6	2 3 7.13	2.0072	7 52 29.2	9.422
7	0 31 51.10	1.8944	0 13 29.4	9.864	7	2 5 7.67	2.0108	8 1 53.7	9.395
8	0 33 44.80	1.8957	0 23 21.4	9.869	8	2 7 8.43	2.0145	8 11 16.6	9.367
9	0 35 38.58	1.8970	0 33 13.7	9.873	9	2 9 9.41	2.0181	8 20 37.8	9.339
10	0 37 32.44	1.8983	0 43 6.2	9.877	10	2 11 10.60	2.0217	8 29 57.3	9.310
11	0 39 26.38	1.8997	0 52 59.0	9.881	11	2 13 12.01	2.0254	8 39 15.0	9.281
12	0 41 20.41	1.9012	1 2 52.0	9.884	12	2 15 13.65	2.0292	8 48 31.0	9.251
13	0 43 14.53	1.9027	1 12 45.1	9.886	13	2 17 15.51	2.0329	8 57 45.1	9.219
14	0 45 8.74	1.9042	1 22 38.3	9.888	14	2 19 17.60	2.0367	9 6 57.3	9.187
15	0 47 3.04	1.9058	1 32 31.7	9.890	15	2 21 19.92	2.0406	9 16 7.5	9.154
16	0 48 57.44	1.9075	1 42 25.1	9.890	16	2 23 22.47	2.0444	9 25 15.7	9.120
17	0 50 51.94	1.9092	1 52 18.5	9.889	17	2 25 25.25	2.0483	9 34 21.8	9.085
18	0 52 46.55	1.9110	2 2 11.8	9.888	18	2 27 28.27	2.0523	9 43 25.9	9.049
19	0 54 41.26	1.9128	2 12 5.1	9.887	19	2 29 31.53	2.0563	9 52 27.7	9.013
20	0 56 36.09	1.9147	2 21 58.3	9.885	20	2 31 35.03	2.0604	10 1 27.4	8.976
21	0 58 31.03	1.9166	2 31 51.3	9.882	21	2 33 38.78	2.0645	10 10 24.8	8.937
22	1 0 26.08	1.9185	2 41 44.1	9.879	22	2 35 42.77	2.0686	10 19 19.8	8.897
23	1 2 21.25	1.9206	N. 2 51 36.8	9.876	23	2 37 47.01	2.0727	N.10 28 12.5	8.857
	MONDAY 6.					**WEDNESDAY 8.**			
0	1 4 16.55	1.9227	N. 3 1 29.3	9.872	0	2 39 51.50	2.0769	N.10 37 2.7	8.816
1	1 6 11.97	1.9248	3 11 21.5	9.867	1	2 41 56.24	2.0811	10 45 50.4	8.774
2	1 8 7.52	1.9269	3 21 13.3	9.861	2	2 44 1.23	2.0853	10 54 35.6	8.732
3	1 10 3.20	1.9292	3 31 4.8	9.855	3	2 46 6.48	2.0896	11 3 18.2	8.688
4	1 11 59.02	1.9315	3 40 55.9	9.847	4	2 48 11.99	2.0939	11 11 58.1	8.643
5	1 13 54.98	1.9338	3 50 46.5	9.839	5	2 50 17.75	2.0982	11 20 35.4	8.598
6	1 15 51.07	1.9361	4 0 36.6	9.831	6	2 52 23.77	2.1026	11 29 9.9	8.552
7	1 17 47.31	1.9386	4 10 26.2	9.822	7	2 54 30.06	2.1070	11 37 41.6	8.504
8	1 19 43.70	1.9410	4 20 15.3	9.813	8	2 56 36.61	2.1113	11 46 10.4	8.456
9	1 21 40.23	1.9435	4 30 3.8	9.803	9	2 58 43.42	2.1157	11 54 36.3	8.407
10	1 23 36.92	1.9461	4 39 51.7	9.792	10	3 0 50.50	2.1202	12 2 59.2	8.356
11	1 25 33.76	1.9487	4 49 38.8	9.779	11	3 2 57.85	2.1247	12 11 19.0	8.304
12	1 27 30.76	1.9514	4 59 25.2	9.767	12	3 5 5.46	2.1292	12 19 35.7	8.252
13	1 29 27.92	1.9541	5 9 10.8	9.754	13	3 7 13.35	2.1337	12 27 49.2	8.199
14	1 31 25.25	1.9569	5 18 55.7	9.741	14	3 9 21.51	2.1382	12 35 59.5	8.145
15	1 33 22.74	1.9597	5 28 39.8	9.727	15	3 11 29.94	2.1428	12 44 6.6	8.091
16	1 35 20.41	1.9626	5 38 23.0	9.712	16	3 13 38.65	2.1474	12 52 10.4	8.035
17	1 37 18.25	1.9654	5 48 5.2	9.695	17	3 15 47.63	2.1520	13 0 10.8	7.977
18	1 39 16.26	1.9683	5 57 46.4	9.678	18	3 17 56.89	2.1566	13 8 7.7	7.919
19	1 41 14.45	1.9714	6 7 26.6	9.661	19	3 20 6.43	2.1612	13 16 1.1	7.860
20	1 43 12.83	1.9745	6 17 5.7	9.643	20	3 22 16.24	2.1658	13 23 50.9	7.800
21	1 45 11.39	1.9775	6 26 43.8	9.625	21	3 24 26.33	2.1705	13 31 37.1	7.739
22	1 47 10.13	1.9806	6 36 20.7	9.605	22	3 26 36.70	2.1752	13 39 19.6	7.677
23	1 49 9.06	1.9838	6 45 56.4	9.585	23	3 28 47.35	2.1799	13 46 58.4	7.615
24	1 51 8.19	1.9871	N. 6 55 30.9	9.564	24	3 30 58.29	2.1846	N.13 54 33.4	7.551

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 30 58.29	2.1846	N.13 54 33.4	7.551
1	3 33 9.51	2.1893	14 2 4.5	7.486
2	3 35 21.01	2.1940	14 9 31.7	7.420
3	3 37 32.79	2.1987	14 16 54.9	7.352
4	3 39 44.85	2.2034	14 24 14.0	7.284
5	3 41 57.20	2.2082	14 31 29.0	7.216
6	3 44 9.83	2.2129	14 38 39.9	7.147
7	3 46 22.75	2.2176	14 45 46.6	7.075
8	3 48 35.95	2.2223	14 52 48.9	7.003
9	3 50 49.43	2.2271	14 59 46.9	6.930
10	3 53 3.20	2.2318	15 6 40.5	6.857
11	3 55 17.25	2.2365	15 13 29.7	6.782
12	3 57 31.58	2.2412	15 20 14.3	6.705
13	3 59 46.19	2.2459	15 26 54.3	6.628
14	4 2 1.09	2.2506	15 33 29.7	6.551
15	4 4 16.27	2.2553	15 40 0.4	6.472
16	4 6 31.73	2.2600	15 46 26.3	6.392
17	4 8 47.47	2.2647	15 52 47.4	6.310
18	4 11 3.50	2.2694	15 59 3.5	6.228
19	4 13 19.80	2.2740	16 5 14.7	6.145
20	4 15 36.38	2.2787	16 11 20.9	6.062
21	4 17 53.24	2.2833	16 17 22.1	5.977
22	4 20 10.37	2.2878	16 23 18.1	5.890
23	4 22 27.77	2.2923	N.16 29 8.9	5.803

FRIDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	4 24 45.45	2.2969	N.16 34 54.5	5.716
1	4 27 3.40	2.3014	16 40 34.8	5.627
2	4 29 21.62	2.3059	16 46 9.7	5.537
3	4 31 40.11	2.3104	16 51 39.2	5.447
4	4 33 58.87	2.3148	16 57 3.3	5.355
5	4 36 17.89	2.3193	17 2 21.8	5.262
6	4 38 37.18	2.3237	17 7 34.7	5.168
7	4 40 56.73	2.3280	17 12 42.0	5.074
8	4 43 16.54	2.3323	17 17 43.6	4.978
9	4 45 36.61	2.3366	17 22 39.4	4.882
10	4 47 56.93	2.3408	17 27 29.4	4.784
11	4 50 17.51	2.3451	17 32 13.5	4.686
12	4 52 38.34	2.3492	17 36 51.8	4.588
13	4 54 59.42	2.3533	17 41 24.1	4.488
14	4 57 20.74	2.3574	17 45 50.3	4.388
15	4 59 42.31	2.3615	17 50 10.5	4.286
16	5 2 4.12	2.3654	17 54 24.6	4.182
17	5 4 26.16	2.3693	17 58 32.4	4.078
18	5 6 48.44	2.3732	18 2 34.0	3.974
19	5 9 10.95	2.3771	18 6 29.3	3.869
20	5 11 33.69	2.3809	18 10 18.3	3.764
21	5 13 56.66	2.3847	18 14 1.0	3.657
22	5 16 19.85	2.3883	18 17 37.2	3.549
23	5 18 43.26	2.3919	18 21 6.9	3.442
24	5 21 6.88	2.3955	N.18 24 30.2	3.333

SATURDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	5 21 6.88	2.3955	N.18 24 30.2	3.333
1	5 23 30.72	2.3991	18 27 46.9	3.223
2	5 25 54.77	2.4025	18 30 57.0	3.112
3	5 28 19.02	2.4058	18 34 0.4	3.001
4	5 30 43.47	2.4092	18 36 57.1	2.889
5	5 33 8.12	2.4125	18 39 47.1	2.777
6	5 35 32.97	2.4157	18 42 30.4	2.665
7	5 37 58.01	2.4188	18 45 6.9	2.551
8	5 40 23.23	2.4218	18 47 36.5	2.436
9	5 42 48.63	2.4248	18 49 59.2	2.321
10	5 45 14.21	2.4278	18 52 15.0	2.205
11	5 47 39.96	2.4307	18 54 23.8	2.089
12	5 50 5.89	2.4335	18 56 25.7	1.972
13	5 52 31.98	2.4362	18 58 20.5	1.855
14	5 54 58.23	2.4388	19 0 8.3	1.737
15	5 57 24.64	2.4414	19 1 49.0	1.619
16	5 59 51.20	2.4438	19 3 22.6	1.500
17	6 2 17.90	2.4462	19 4 49.0	1.380
18	6 4 44.75	2.4486	19 6 8.2	1.260
19	6 7 11.74	2.4509	19 7 20.2	1.140
20	6 9 38.86	2.4531	19 8 25.0	1.020
21	6 12 6.11	2.4552	19 9 22.6	0.899
22	6 14 33.49	2.4572	19 10 12.9	0.777
23	6 17 0.98	2.4591	N.19 10 55.9	0.655

SUNDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	6 19 28.58	2.4609	N.19 11 31.5	0.532
1	6 21 56.29	2.4627	19 11 59.8	0.410
2	6 24 24.11	2.4645	19 12 20.7	0.287
3	6 26 52.03	2.4661	19 12 34.3	0.165
4	6 29 20.04	2.4676	19 12 40.5	+ 0.042
5	6 31 48.14	2.4691	19 12 39.3	− 0.082
6	6 34 16.33	2.4705	19 12 30.7	0.206
7	6 36 44.60	2.4717	19 12 14.6	0.330
8	6 39 12.94	2.4729	19 11 51.1	0.453
9	6 41 41.35	2.4741	19 11 20.2	0.577
10	6 44 9.83	2.4751	19 10 41.8	0.702
11	6 46 38.36	2.4759	19 9 56.0	0.826
12	6 49 6.94	2.4768	19 9 2.7	0.951
13	6 51 35.57	2.4776	19 8 1.9	1.076
14	6 54 4.25	2.4783	19 6 53.6	1.200
15	6 56 32.97	2.4789	19 5 37.9	1.324
16	6 59 1.72	2.4794	19 4 14.7	1.449
17	7 1 30.50	2.4798	19 2 44.0	1.573
18	7 3 59.30	2.4802	19 1 5.9	1.697
19	7 6 28.12	2.4804	18 59 20.3	1.822
20	7 8 56.95	2.4806	18 57 27.2	1.947
21	7 11 25.79	2.4807	18 55 26.7	2.071
22	7 13 54.64	2.4807	18 53 18.7	2.195
23	7 16 23.48	2.4807	18 51 3.3	2.318
24	7 18 52.32	2.4806	N.18 48 40.5	2.442

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	7 18 52.32	2.4806	N.18 48 40.5	2.442
1	7 21 21.15	2.4803	18 46 10.2	2.566
2	7 23 49.96	2.4800	18 43 32.6	2.689
3	7 26 18.75	2.4797	18 40 47.6	2.812
4	7 28 47.52	2.4792	18 37 55.2	2.934
5	7 31 16.25	2,4786	18 34 55.5	3.056
6	7 33 44.95	2.4780	18 31 48.5	3.178
7	7 36 13.61	2.4773	18 28 34.1	3.300
8	7 38 42.22	2.4765	18 25 12.5	3.421
9	7 41 10.79	2.4757	18 21 43.6	3.542
10	7 43 39.31	2.4747	18 18 7.5	3.663
11	7 46 7.76	2.4737	18 14 24.1	3.783
12	7 48 36.15	2.4727	18 10 33.5	3.902
13	7 51 4.48	2.4715	18 6 35.8	4.022
14	7 53 32.73	2.4702	18 2 30.9	4.141
15	7 56 0.91	2.4690	17 58 18.9	4.259
16	7 58 29.01	2.4677	17 53 59.9	4.376
17	8 0 57.03	2.4662	17 49 33.8	4.493
18	8 3 24.96	2.4647	17 45 0.7	4.609
19	8 5 52.80	2.4632	17 40 20.7	4.725
20	8 8 20.55	2.4617	17 35 33.7	4.841
21	8 10 48.20	2.4600	17 30 39.8	4.955
22	8 13 15.75	2.4582	17 25 39.1	5.069
23	8 15 43.19	2.4564	N.17 20 31.5	5.183

TUESDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	8 18 10.52	2.4546	N.17 15 17.1	5.296
1	8 20 37.74	2.4527	17 9 56.0	5.408
2	8 23 4.84	2.4507	17 4 28.2	5.519
3	8 25 31.83	2.4487	16 58 53.7	5.630
4	8 27 58.69	2.4467	16 53 12.6	5.739
5	8 30 25.43	2.4446	16 47 25.0	5.848
6	8 32 52.04	2.4424	16 41 30.8	5.957
7	8 35 18.52	2.4402	16 35 30.1	6.065
8	8 37 44.86	2.4379	16 29 23.0	6.171
9	8 40 11.07	2.4356	16 23 9.6	6.277
10	8 42 37.14	2.4332	16 16 49.8	6.382
11	8 45 3.06	2.4309	16 10 23.7	6.487
12	8 47 28.84	2.4285	16 3 51.4	6.590
13	8 49 54.48	2.4260	15 57 12.9	6.692
14	8 52 19.96	2.4234	15 50 28.3	6.794
15	8 54 45.29	2.4209	15 43 37.6	6.895
16	8 57 10.47	2.4183	15 36 40.9	6.995
17	8 59 35.49	2.4157	15 29 38.2	7.093
18	9 2 0.35	2.4131	15 22 29.7	7.191
19	9 4 25.06	2.4104	15 15 15.3	7.288
20	9 6 49.60	2.4077	15 7 55.1	7.384
21	9 9 13.98	2.4050	15 0 29.2	7.479
22	9 11 38.20	2.4022	14 52 57.6	7.574
23	9 14 2.25	2.3995	14 45 20.3	7.667
24	9 16 26.14	2.3967	N.14 37 37.5	7.759

WEDNESDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 16 26.14	2.3967	N.14 37 37.5	7.759
1	9 18 49.86	2.3939	14 29 49.2	7.850
2	9 21 13.41	2.3911	14 21 55.5	7.940
3	9 23 36.79	2.3882	14 13 56.4	8.029
4	9 26 0.00	2.3853	14 5 52.0	8.117
5	9 28 23.03	2.3824	13 57 42.3	8.205
6	9 30 45.89	2.3795	13 49 27.4	8.291
7	9 33 8.57	2.3766	13 41 7.4	8.375
8	9 35 31.08	2.3737	13 32 42.4	8.459
9	9 37 53.42	2.3708	13 24 12.4	8.542
10	9 40 15.58	2.3679	13 15 37.4	8.624
11	9 42 37.57	2.3650	13 6 57.5	8.705
12	9 44 59.38	2.3620	12 58 12.8	8.784
13	9 47 21.01	2.3591	12 49 23.4	8.862
14	9 49 42.47	2.3562	12 40 29.3	8.940
15	9 52 3.75	2.3532	12 31 30.6	9.016
16	9 54 24.85	2.3502	12 22 27.4	9.092
17	9 56 45.78	2.3473	12 13 19.6	9.167
18	9 59 6.53	2.3444	12 4 7.4	9.239
19	10 1 27.11	2.3415	11 54 50.9	9.311
20	10 3 47.51	2.3385	11 45 30.1	9.382
21	10 6 7.73	2.3356	11 36 5.1	9.451
22	10 8 27.78	2.3327	11 26 36.0	9.519
23	10 10 47.66	2.3298	N.11 17 2.8	9.586

THURSDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 13 7.36	2.3269	N.11 7 25.7	9.652
1	10 15 26.89	2.3241	10 57 44.6	9.717
2	10 17 46.25	2.3212	10 47 59.6	9.782
3	10 20 5.44	2.3183	10 38 10.8	9.845
4	10 22 24.45	2.3155	10 28 18.2	9.907
5	10 24 43.30	2.3127	10 18 22.0	9.967
6	10 27 1.98	2.3099	10 8 22.2	10.026
7	10 29 20.49	2.3072	9 58 18.9	10.084
8	10 31 38.84	2.3044	9 48 12.1	10.142
9	10 33 57.02	2.3017	9 38 1.9	10.198
10	10 36 15.04	2.2990	9 27 48.4	10.252
11	10 38 32.90	2.2963	9 17 31.6	10.306
12	10 40 50.60	2.2937	9 7 11.7	10.358
13	10 43 8.14	2.2910	8 56 48.7	10.409
14	10 45 25.52	2.2884	8 46 22.6	10.459
15	10 47 42.75	2.2858	8 35 53.6	10.508
16	10 49 59.82	2.2832	8 25 21.7	10.556
17	10 52 16.74	2.2807	8 14 46.9	10.602
18	10 54 33.51	2.2782	8 4 9.4	10.647
19	10 56 50.13	2.2757	7 53 29.2	10.692
20	10 59 6.60	2.2733	7 42 46.3	10.736
21	11 1 22.93	2.2710	7 32 0.9	10.778
22	11 3 39.12	2.2686	7 21 13.0	10.818
23	11 5 55.17	2.2662	7 10 22.7	10.857
24	11 8 11.07	2.2639	N. 6 59 30.1	10.896

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 17.			
	h m s	s	° ′ ″	″
0	11 8 11.07	2.2639	N. 6 59 30.1	10.896
1	11 10 26.84	2.2617	6 48 35.2	10.933
2	11 12 42.48	2.2595	6 37 38.1	10.970
3	11 14 57.98	2.2573	6 26 38.8	11.005
4	11 17 13.35	2.2561	6 15 37.5	11.039
5	11 19 28.59	2.2530	6 4 34.2	11.072
6	11 21 43.71	2.2509	5 53 28.9	11.103
7	11 23 58.70	2.2488	5 42 21.8	11.133
8	11 26 13.57	2.2469	5 31 12.9	11.162
9	11 28 28.33	2.2450	5 20 2.3	11.191
10	11 30 42.97	2.2430	5 8 50.0	11.218
11	11 32 57.49	2.2411	4 57 36.1	11.244
12	11 35 11.90	2.2393	4 46 20.7	11.268
13	11 37 26.20	2.2375	4 35 3.9	11.292
14	11 39 40.40	2.2357	4 23 45.7	11.315
15	11 41 54.49	2.2340	4 12 26.1	11.337
16	11 44 8.48	2.2323	4 1 5.3	11.357
17	11 46 22.37	2.2307	3 49 43.3	11.376
18	11 48 36.16	2.2291	3 38 20.2	11.393
19	11 50 49.86	2.2276	3 26 56.1	11.410
20	11 53 3.47	2.2261	3 15 31.0	11.426
21	11 55 16.99	2.2246	3 4 5.0	11.441
22	11 57 30.42	2.2232	2 52 38.1	11.454
23	11 59 43.77	2.2218	N. 2 41 10.5	11.466
	SATURDAY 18.			
0	12 1 57.04	2.2205	N. 2 29 42.2	11.477
1	12 4 10.23	2.2192	2 18 13.2	11.488
2	12 6 23.35	2.2180	2 6 43.6	11.497
3	12 8 36.39	2.2168	1 55 13.5	11.505
4	12 10 49.36	2.2157	1 43 43.0	11.511
5	12 13 2.27	2.2146	1 32 12.2	11.516
6	12 15 15.11	2.2135	1 20 41.1	11.521
7	12 17 27.89	2.2125	1 9 9.7	11.525
8	12 19 40.61	2.2115	0 57 38.1	11.527
9	12 21 53.27	2.2106	0 46 6.4	11.529
10	12 24 5.88	2.2097	0 34 34.6	11.529
11	12 26 18.44	2.2088	0 23 2.9	11.527
12	12 28 30.94	2.2080	N. 0 11 31.3	11.525
13	12 30 43.40	2.2073	S. 0 0 0.1	11.522
14	12 32 55.82	2.2067	0 11 31.4	11.519
15	12 35 8.20	2.2060	0 23 2.4	11.513
16	12 37 20.54	2.2054	0 34 33.0	11.507
17	12 39 32.85	2.2049	0 46 3.2	11.500
18	12 41 45.13	2.2044	0 57 33.0	11.492
19	12 43 57.38	2.2039	1 9 2.2	11.482
20	12 46 9.60	2.2034	1 20 30.8	11.471
21	12 48 21.79	2.2030	1 31 58.7	11.459
22	12 50 33.96	2.2027	1 43 25.8	11.446
23	12 52 46.11	2.2024	1 54 52.2	11.433
24	12 54 58.25	2.2021	S. 2 6 17.7	11.418

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 19.			
	h m s	s	° ′ ″	″
0	12 54 58.25	2.2021	S. 2 6 17.7	11.418
1	12 57 10.37	2.2019	2 17 42.3	11.402
2	12 59 22.48	2.2018	2 29 5.9	11.384
3	13 1 34.59	2.2017	2 40 28.4	11.366
4	13 3 46.69	2.2017	2 51 49.8	11.347
5	13 5 58.79	2.2016	3 3 10.0	11.327
6	13 8 10.88	2.2016	3 14 29.0	11.306
7	13 10 22.98	2.2017	3 25 46.7	11.283
8	13 12 35.08	2.2018	3 37 3.0	11.259
9	13 14 47.19	2.2019	3 48 17.8	11.234
10	13 16 59.31	2.2021	3 59 31.1	11.209
11	13 19 11.44	2.2023	4 10 42.9	11.183
12	13 21 23.58	2.2025	4 21 53.1	11.156
13	13 23 35.74	2.2028	4 33 1.6	11.127
14	13 25 47.92	2.2032	4 44 8.4	11.097
15	13 28 0.12	2.2035	4 55 13.3	11.066
16	13 30 12.34	2.2039	5 6 16.3	11.034
17	13 32 24.59	2.2044	5 17 17.4	11.002
18	13 34 36.87	2.2049	5 28 16.6	10.969
19	13 36 49.18	2.2054	5 39 13.7	10.934
20	13 39 1.52	2.2059	5 50 8.7	10.898
21	13 41 13.89	2.2065	6 1 1.5	10.862
22	13 43 26.30	2.2072	6 11 52.1	10.824
23	13 45 38.75	2.2078	S. 6 22 40.4	10.785
	MONDAY 20.			
0	13 47 51.23	2.2084	S. 6 33 26.3	10.745
1	13 50 3.76	2.2092	6 44 9.8	10.704
2	13 52 16.33	2.2099	6 54 50.8	10.662
3	13 54 28.95	2.2107	7 5 29.3	10.620
4	13 56 41.62	2.2116	7 16 5.2	10.576
5	13 58 54.34	2.2124	7 26 38.4	10.532
6	14 1 7.11	2.2133	7 37 9.0	10.487
7	14 3 19.93	2.2142	7 47 36.8	10.439
8	14 5 32.81	2.2152	7 58 1.7	10.391
9	14 7 45.75	2.2162	8 8 23.7	10.342
10	14 9 58.75	2.2172	8 18 42.7	10.292
11	14 12 11.81	2.2181	8 28 58.8	10.242
12	14 14 24.92	2.2191	8 39 11.8	10.191
13	14 16 38.10	2.2202	8 49 21.7	10.138
14	14 18 51.34	2.2213	8 59 28.4	10.085
15	14 21 4.65	2.2224	9 9 31.9	10.031
16	14 23 18.03	2.2236	9 19 32.1	9.975
17	14 25 31.48	2.2247	9 29 28.9	9.919
18	14 27 44.99	2.2259	9 39 22.3	9.862
19	14 29 58.58	2.2271	9 49 12.3	9.803
20	14 32 12.24	2.2282	9 58 58.7	9.743
21	14 34 25.97	2.2294	10 8 41.5	9.683
22	14 36 39.77	2.2307	10 18 20.7	9.623
23	14 38 53.65	2.2320	10 27 56.3	9.562
24	14 41 7.61	2.2333	S. 10 37 28.1	9.499

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 41 7.61	2.2333	S. 10 37 28.1	9.499
1	14 43 21.65	2.2346	10 46 56.1	9.435
2	14 45 35.76	2.2359	10 56 20.3	9.370
3	14 47 49.95	2.2372	11 5 40.5	9.304
4	14 50 4.22	2.2385	11 14 56.8	9.238
5	14 52 18.57	2.2398	11 24 9.1	9.171
6	14 54 32.99	2.2411	11 33 17.3	9.103
7	14 56 47.50	2.2425	11 42 21.4	9.034
8	14 59 2.09	2.2438	11 51 21.4	8.964
9	15 1 16.76	2.2452	12 0 17.1	8.893
10	15 3 31.51	2.2466	12 9 8.5	8.821
11	15 5 46.35	2.2480	12 17 55.6	8.749
12	15 8 1.27	2.2493	12 26 38.4	8.677
13	15 10 16.27	2.2507	12 35 16.8	8.603
14	15 12 31.36	2.2521	12 43 50.7	8.527
15	15 14 46.53	2.2535	12 52 20.0	8.450
16	15 17 1.78	2.2548	13 0 44.7	8.373
17	15 19 17.11	2.2562	13 9 4.8	8.296
18	15 21 32.52	2.2575	13 17 20.3	8.218
19	15 23 48.01	2.2589	13 25 31.0	8.139
20	15 26 3.59	2.2603	13 33 37.0	8.060
21	15 28 19.25	2.2617	13 41 38.2	7.980
22	15 30 34.99	2.2630	13 49 34.6	7.898
23	15 32 50.81	2.2644	S. 13 57 26.0	7.816

WEDNESDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 35 6.72	2.2657	S. 14 5 12.5	7.733
1	15 37 22.70	2.2670	14 12 54.0	7.650
2	15 39 38.76	2.2683	14 20 30.5	7.566
3	15 41 54.90	2.2696	14 28 1.9	7.480
4	15 44 11.11	2.2708	14 35 28.1	7.394
5	15 46 27.40	2.2721	14 42 49.2	7.308
6	15 48 43.77	2.2734	14 50 5.1	7.221
7	15 51 0.21	2.2747	14 57 15.7	7.133
8	15 53 16.73	2.2759	15 4 21.0	7.045
9	15 55 33.32	2.2771	15 11 21.1	6.957
10	15 57 49.98	2.2782	15 18 15.8	6.867
11	16 0 6.71	2.2793	15 25 5.1	6.776
12	16 2 23.50	2.2804	15 31 48.9	6.684
13	16 4 40.36	2.2816	15 38 27.2	6.593
14	16 6 57.29	2.2827	15 45 0.0	6.501
15	16 9 14.29	2.2838	15 51 27.3	6.408
16	16 11 31.35	2.2848	15 57 49.0	6.314
17	16 13 48.47	2.2857	16 4 5.0	6.220
18	16 16 5.64	2.2867	16 10 15.4	6.126
19	16 18 22.87	2.2877	16 16 20.1	6.031
20	16 20 40.16	2.2887	16 22 19.1	5.935
21	16 22 57.51	2.2896	16 28 12.3	5.838
22	16 25 14.91	2.2904	16 33 59.7	5.741
23	16 27 32.36	2.2912	16 39 41.3	5.644
24	16 29 49.85	2.2919	S. 16 45 17.0	5.547

THURSDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 29 49.85	2.2919	S. 16 45 17.0	5.547
1	16 32 7.39	2.2927	16 50 46.9	5.448
2	16 34 24.98	2.2935	16 56 10.8	5.349
3	16 36 42.61	2.2942	17 1 28.8	5.250
4	16 39 0.28	2.2948	17 6 40.8	5.150
5	16 41 17.98	2.2954	17 11 46.8	5.051
6	16 43 35.72	2.2960	17 16 46.9	4.951
7	16 45 53.50	2.2965	17 21 40.9	4.849
8	16 48 11.30	2.2969	17 26 28.8	4.748
9	16 50 29.13	2.2973	17 31 10.6	4.646
10	16 52 46.98	2.2978	17 35 46.3	4.544
11	16 55 4.86	2.2982	17 40 15.9	4.441
12	16 57 22.76	2.2985	17 44 39.3	4.338
13	16 59 40.68	2.2987	17 48 56.5	4.235
14	17 1 58.61	2.2989	17 53 7.5	4.132
15	17 4 16.55	2.2991	17 57 12.4	4.029
16	17 6 34.50	2.2992	18 1 11.0	3.925
17	17 8 52.46	2.2993	18 5 3.4	3.821
18	17 11 10.42	2.2993	18 8 49.5	3.716
19	17 13 28.38	2.2993	18 12 29.3	3.611
20	17 15 46.34	2.2993	18 16 2.8	3.507
21	17 18 4.30	2.2992	18 19 30.1	3.402
22	17 20 22.25	2.2990	18 22 51.0	3.296
23	17 22 40.18	2.2988	S. 18 26 5.6	3.190

FRIDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 24 58.10	2.2986	S. 18 29 13.8	3.084
1	17 27 16.01	2.2983	18 32 15.7	2.978
2	17 29 33.90	2.2979	18 35 11.2	2.873
3	17 31 51.76	2.2974	18 38 0.4	2.767
4	17 34 9.59	2.2969	18 40 43.2	2.660
5	17 36 27.39	2.2964	18 43 19.6	2.553
6	17 38 45.16	2.2959	18 45 49.6	2.447
7	17 41 2.90	2.2953	18 48 13.2	2.341
8	17 43 20.60	2.2946	18 50 30.5	2.235
9	17 45 38.25	2.2938	18 52 41.4	2.128
10	17 47 55.86	2.2931	18 54 45.9	2.021
11	17 50 13.42	2.2922	18 56 44.0	1.914
12	17 52 30.93	2.2913	18 58 35.6	1.807
13	17 54 48.38	2.2904	19 0 20.8	1.701
14	17 57 5.78	2.2895	19 1 59.7	1.595
15	17 59 23.12	2.2884	19 3 32.2	1.488
16	18 1 40.39	2.2873	19 4 58.3	1.382
17	18 3 57.59	2.2862	19 6 18.0	1.275
18	18 6 14.73	2.2850	19 7 31.3	1.168
19	18 8 31.79	2.2837	19 8 38.2	1.062
20	18 10 48.77	2.2823	19 9 38.8	0.956
21	18 13 5.67	2.2809	19 10 33.0	0.850
22	18 15 22.48	2.2795	19 11 20.8	0.744
23	18 17 39.21	2.2781	19 12 2.3	0.638
24	18 19 55.85	2.2766	S. 19 12 37.5	0.534

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 19 55.85	2.2766	S. 19 12 37.5	0.534
1	18 22 12.40	2.2750	19 13 6.4	0.428
2	18 24 28.85	2.2733	19 13 28.9	0.322
3	18 26 45.20	2.2717	19 13 45.1	0.217
4	18 29 1.45	2.2699	19 13 55.0	0.113
5	18 31 17.59	2.2681	19 13 58.7	− 0.009
6	18 33 33.62	2.2662	19 13 56.1	+ 0.095
7	18 35 49.54	2.2644	19 13 47.3	0.199
8	18 38 5.35	2.2625	19 13 32.2	0.303
9	18 40 21.04	2.2605	19 13 10.9	0.406
10	18 42 36.61	2.2584	19 12 43.4	0.509
11	18 44 52.05	2.2563	19 12 9.8	0.612
12	18 47 7.37	2.2542	19 11 30.0	0.714
13	18 49 22.56	2.2521	19 10 44.1	0.816
14	18 51 37.62	2.2498	19 9 52.1	0.918
15	18 53 52.54	2.2476	19 8 53.9	1.020
16	18 56 7.33	2.2453	19 7 49.7	1.121
17	18 58 21.98	2.2429	19 6 39.4	1.222
18	19 0 36.48	2.2405	19 5 23.1	1.322
19	19 2 50.84	2.2381	19 4 0.8	1.422
20	19 5 5.05	2.2356	19 2 32.5	1.521
21	19 7 19.11	2.2331	19 0 58.3	1.620
22	19 9 33.02	2.2305	18 59 18.1	1.719
23	19 11 46.77	2.2278	S. 18 57 32.0	1.817

SUNDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 14 0.36	2.2252	S. 18 55 40.1	1.914
1	19 16 13.80	2.2226	18 53 42.3	2.011
2	19 18 27.07	2.2199	18 51 38.7	2.108
3	19 20 40.18	2.2171	18 49 29.3	2.205
4	19 22 53.12	2.2142	18 47 14.1	2.301
5	19 25 5.89	2.2114	18 44 53.2	2.396
6	19 27 18.49	2.2086	18 42 26.6	2.491
7	19 29 30.92	2.2057	18 39 54.3	2.585
8	19 31 43.17	2.2027	18 37 16.4	2.679
9	19 33 55.24	2.1997	18 34 32.8	2.772
10	19 36 7.14	2.1968	18 31 43.7	2.864
11	19 38 18.86	2.1937	18 28 49.1	2.957
12	19 40 30.39	2.1907	18 25 48.9	3.049
13	19 42 41.74	2.1876	18 22 43.2	3.140
14	19 44 52.90	2.1845	18 19 32.1	3.230
15	19 47 3.88	2.1814	18 16 15.6	3.320
16	19 49 14.67	2.1782	18 12 53.7	3.409
17	19 51 25.27	2.1750	18 9 26.5	3.498
18	19 53 35.67	2.1718	18 5 53.9	3.586
19	19 55 45.88	2.1686	18 2 16.1	3.674
20	19 57 55.90	2.1653	17 58 33.0	3.762
21	20 0 5.72	2.1620	17 54 44.7	3.848
22	20 2 15.34	2.1587	17 50 51.3	3.933
23	20 4 24.76	2.1554	17 46 52.7	4.018
24	20 6 33.99	2.1521	S. 17 42 49.1	4.103

MONDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 6 33.99	2.1521	S. 17 42 49.1	4.103
1	20 8 43.02	2.1487	17 38 40.4	4.187
2	20 10 51.84	2.1453	17 34 26.7	4.270
3	20 13 0.46	2.1420	17 30 8.0	4.353
4	20 15 8.88	2.1386	17 25 44.3	4.435
5	20 17 17.09	2.1352	17 21 15.8	4.516
6	20 19 25.10	2.1317	17 16 42.4	4.597
7	20 21 32.90	2.1283	17 12 4.1	4.677
8	20 23 40.50	2.1249	17 7 21.1	4.757
9	20 25 47.89	2.1215	17 2 33.3	4.836
10	20 27 55.08	2.1181	16 57 40.8	4.914
11	20 30 2.06	2.1146	16 52 43.7	4.991
12	20 32 8.83	2.1111	16 47 41.9	5.068
13	20 34 15.39	2.1076	16 42 35.5	5.144
14	20 36 21.74	2.1042	16 37 24.6	5.219
15	20 38 27.89	2.1007	16 32 9.2	5.294
16	20 40 33.83	2.0972	16 26 49.3	5.368
17	20 42 39.56	2.0937	16 21 25.0	5.442
18	20 44 45.08	2.0902	16 15 56.2	5.516
19	20 46 50.39	2.0868	16 10 23.0	5.588
20	20 48 55.50	2.0833	16 4 45.6	5.658
21	20 51 0.39	2.0798	15 59 4.0	5.728
22	20 53 5.07	2.0763	15 53 18.2	5.799
23	20 55 9.55	2.0729	S. 15 47 28.1	5.870

TUESDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	20 57 13.82	2.0694	S. 15 41 33.8	5.939
1	20 59 17.88	2.0660	15 35 35.4	6.007
2	21 1 21.74	2.0626	15 29 33.0	6.074
3	21 3 25.39	2.0591	15 23 26.5	6.141
4	21 5 28.83	2.0557	15 17 16.0	6.207
5	21 7 32.07	2.0523	15 11 1.6	6.272
6	21 9 35.11	2.0489	15 4 43.3	6.337
7	21 11 37.94	2.0455	14 58 21.1	6.402
8	21 13 40.57	2.0422	14 51 55.1	6.465
9	21 15 43.00	2.0388	14 45 25.3	6.528
10	21 17 45.23	2.0354	14 38 51.7	6.590
11	21 19 47.25	2.0320	14 32 14.5	6.651
12	21 21 49.07	2.0287	14 25 33.6	6.712
13	21 23 50.69	2.0254	14 18 49.0	6.772
14	21 25 52.12	2.0222	14 12 0.9	6.832
15	21 27 53.35	2.0189	14 5 9.2	6.891
16	21 29 54.39	2.0157	13 58 14.0	6.949
17	21 31 55.23	2.0124	13 51 15.4	7.006
18	21 33 55.88	2.0092	13 44 13.3	7.063
19	21 35 56.34	2.0061	13 37 7.8	7.119
20	21 37 56.61	2.0029	13 29 59.0	7.174
21	21 39 56.68	1.9998	13 22 46.9	7.229
22	21 41 56.56	1.9965	13 15 31.5	7.284
23	21 43 56.26	1.9935	13 8 12.8	7.338
24	21 45 55.78	1.9904	S. 13 0 50.9	7.391

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 45 55.78	1.9904	S. 13 0 50.9	7.391
1	21 47 55.11	1.9873	12 53 25.9	7.443
2	21 49 54.26	1.9843	12 45 57.8	7.494
3	21 51 53.23	1.9813	12 38 26.6	7.546
4	21 53 52.02	1.9784	12 30 52.3	7.596
5	21 55 50.64	1.9755	12 23 15.1	7.645
6	21 57 49.08	1.9726	12 15 34.9	7.694
7	21 59 47.35	1.9697	12 7 51.8	7.743
8	22 1 45.44	1.9668	12 0 5.8	7.791
9	22 3 43.36	1.9640	11 52 16.9	7.838
10	22 5 41.12	1.9612	11 44 25.2	7.885
11	22 7 38.71	1.9584	11 36 30.7	7.931
12	22 9 36.13	1.9557	11 28 33.5	7.976
13	22 11 33.39	1.9530	11 20 33.6	8.021
14	22 13 30.49	1.9503	11 12 31.0	8.065
15	22 15 27.43	1.9477	11 4 25.8	8.108
16	22 17 24.22	1.9452	10 56 18.0	8.151
17	22 19 20.85	1.9426	10 48 7.7	8.193
18	22 21 17.33	1.9401	10 39 54.8	8.235
19	22 23 13.66	1.9376	10 31 39.5	8.276
20	22 25 9.84	1.9352	10 23 21.7	8.317
21	22 27 5.88	1.9327	10 15 1.5	8.357
22	22 29 1.77	1.9303	10 6 38.9	8.396
23	22 30 57.52	1.9280	S. 9 58 14.0	8.434

THURSDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 32 53.13	1.9257	S. 9 49 46.8	8.472
1	22 34 48.60	1.9234	9 41 17.3	8.510
2	22 36 43.94	1.9212	9 32 45.6	8.547
3	22 38 39.15	1.9191	9 24 11.7	8.583
4	22 40 34.23	1.9169	9 15 35.6	8.619
5	22 42 29.18	1.9148	9 6 57.4	8.654
6	22 44 24.01	1.9127	8 58 17.1	8.689
7	22 46 18.71	1.9107	8 49 34.7	8.723
8	22 48 13.30	1.9088	8 40 50.3	8.756
9	22 50 7.77	1.9068	8 32 3.9	8.789
10	22 52 2.12	1.9049	8 23 15.6	8.822
11	22 53 56.36	1.9031	8 14 25.3	8.854
12	22 55 50.49	1.9013	8 5 33.1	8.885
13	22 57 44.51	1.8995	7 56 39.1	8.915
14	22 59 38.43	1.8978	7 47 43.3	8.946
15	23 1 32.25	1.8962	7 38 45.6	8.976
16	23 3 25.97	1.8945	7 29 46.2	9.004
17	23 5 19.59	1.8929	7 20 45.1	9.033
18	23 7 13.12	1.8914	7 11 42.3	9.061
19	23 9 6.56	1.8899	7 2 37.8	9.088
20	23 10 59.91	1.8884	6 53 31.7	9.115
21	23 12 53.17	1.8870	6 44 24.0	9.142
22	23 14 46.35	1.8857	6 35 14.7	9.167
23	23 16 39.45	1.8844	6 26 3.9	9.192
24	23 18 32.47	1.8831	S. 6 16 51.6	9.217

FRIDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 18 32.47	1.8831	S. 6 16 51.6	9.217
1	23 20 25.42	1.8819	6 7 37.8	9.242
2	23 22 18.30	1.8808	5 58 22.6	9.265
3	23 24 11.11	1.8797	5 49 6.0	9.288
4	23 26 3.86	1.8786	5 39 48.0	9.311
5	23 27 56.54	1.8775	5 30 28.7	9.333
6	23 29 49.16	1.8766	5 21 8.0	9.355
7	23 31 41.73	1.8757	5 11 46.1	9.376
8	23 33 34.24	1.8748	5 2 22.9	9.397
9	23 35 26.70	1.8739	4 52 58.5	9.417
10	23 37 19.11	1.8732	4 43 32.9	9.436
11	23 39 11.48	1.8724	4 34 6.2	9.455
12	23 41 3.80	1.8717	4 24 38.3	9.474
13	23 42 56.08	1.8711	4 15 9.3	9.491
14	23 44 48.33	1.8706	4 5 39.3	9.508
15	23 46 40.55	1.8701	3 56 8.3	9.525
16	23 48 32.74	1.8696	3 46 36.3	9.542
17	23 50 24.90	1.8691	3 37 3.3	9.558
18	23 52 17.03	1.8687	3 27 29.3	9.574
19	23 54 9.14	1.8684	3 17 54.4	9.588
20	23 56 1.24	1.8682	3 8 18.7	9.602
21	23 57 53.32	1.8679	2 58 42.2	9.615
22	23 59 45.39	1.8678	2 49 4.9	9.629
23	0 1 37.45	1.8677	S. 2 39 26.7	9.643

SATURDAY, JANUARY 1, 1887.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 3 29.51	1.8676	S. 2 29 47.7	9.656

PHASES OF THE MOON.

		d	h	m
☽ First Quarter	Dec.	3	2	25.0
○ Full Moon		10	21	30.2
☾ Last Quarter		17	18	39.1
● New Moon		24	21	54.7

		d	h
☾ Apogee	Dec.	3	2.9
☾ Perigee		15	12.0
☾ Apogee		31	0.2

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Sun	W.	67 14 23	3409	68 36 29	3417	69 58 26	3425	71 20 14	3432
	Mars	W.	34 22 37	3347	35 45 54	3351	37 9 6	3356	38 32 13	3361
	α Arietis	E.	79 30 27	3152	78 3 20	3161	76 36 24	3170	75 9 39	3179
	Aldebaran	E.	111 44 6	3006	110 14 1	3013	108 44 5	3020	107 14 17	3026
2	Sun	W.	78 7 25	3461	79 28 33	3464	80 49 37	3468	82 10 37	3471
	Mars	W.	45 26 34	3379	46 49 14	3382	48 11 51	3384	49 34 26	3386
	α Aquilæ	W.	39 34 42	4483	40 38 49	4402	41 44 8	4329	42 50 34	4261
	α Arietis	E.	67 58 28	3220	66 32 42	3228	65 7 6	3236	63 41 40	3244
	Aldebaran	E.	99 47 12	3054	98 18 6	3058	96 49 5	3061	95 20 8	3065
3	Sun	W.	88 54 55	3479	90 15 43	3480	91 36 30	3479	92 57 18	3478
	Mars	W.	56 26 56	3389	57 49 25	3388	59 11 55	3387	60 34 26	3386
	α Aquilæ	W.	48 36 47	4005	49 48 22	3964	51 0 37	3926	52 13 30	3892
	α Arietis	E.	56 36 38	3281	55 12 4	3288	53 47 38	3295	52 23 21	3304
	Aldebaran	E.	87 56 6	3072	86 27 22	3072	84 58 38	3071	83 29 53	3070
4	Sun	W.	99 41 48	3464	101 2 52	3461	102 24 0	3455	103 45 14	3450
	Mars	W.	67 27 42	3370	68 50 33	3365	70 13 29	3359	71 36 32	3354
	α Aquilæ	W.	58 26 3	3746	59 42 1	3723	60 58 24	3699	62 15 12	3677
	α Arietis	E.	45 24 30	3352	44 1 19	3365	42 38 22	3379	41 15 41	3383
	Aldebaran	E.	76 5 39	3058	74 36 38	3054	73 7 32	3050	71 38 21	3044
5	Sun	W.	110 33 3	3417	111 55 0	3409	113 17 6	3400	114 39 22	3392
	Mars	W.	78 33 31	3319	79 57 20	3311	81 21 19	3302	82 45 28	3294
	α Aquilæ	W.	68 44 55	3576	70 3 55	3558	71 23 15	3541	72 42 54	3523
	Fomalhaut	W.	35 52 52	3992	37 4 39	3919	38 17 40	3852	39 31 49	3791
	Aldebaran	E.	64 10 40	3014	62 40 44	3005	61 10 38	2997	59 40 22	2989
6	Sun	W.	121 33 20	3343	122 56 42	3332	124 20 17	3320	125 44 5	3309
	α Aquilæ	W.	79 25 49	3443	80 47 17	3429	82 9 1	3414	83 31 2	3400
	Fomalhaut	W.	45 57 7	3545	47 16 41	3506	48 36 59	3468	49 57 59	3432
	α Pegasi	W.	32 57 9	4140	34 6 32	4038	35 17 34	3946	36 30 7	3863
	Aldebaran	E.	52 6 16	2942	50 34 50	2931	49 3 10	2920	47 31 17	2909
	Saturn	E.	95 34 31	2927	94 2 47	2916	92 30 49	2905	90 58 37	2894
	Pollux	E.	96 3 9	3006	94 33 4	2996	93 2 46	2985	91 32 15	2974
7	Fomalhaut	W.	56 52 24	3278	58 17 1	3252	59 42 9	3225	61 7 48	3200
	α Pegasi	W.	42 52 3	3541	44 11 42	3490	45 32 17	3443	46 53 45	3399
	Aldebaran	E.	39 48 7	2848	38 14 42	2836	36 41 1	2823	35 7 3	2810
	Saturn	E.	83 13 55	2835	81 40 12	2821	80 6 12	2809	78 31 56	2795
	Pollux	E.	83 55 59	2914	82 23 58	2902	80 51 42	2890	79 19 10	2876
8	Fomalhaut	W.	68 23 16	3086	69 51 43	3065	71 20 36	3045	72 49 53	3025
	α Pegasi	W.	53 52 46	3213	55 18 40	3182	56 45 11	3152	58 12 18	3123
	Saturn	E.	70 36 12	2729	69 0 10	2714	67 23 49	2701	65 47 10	2687
	Pollux	E.	71 32 27	2815	69 58 18	2802	68 23 53	2790	66 49 12	2777
	Regulus	E.	107 20 16	2742	105 44 32	2728	104 8 29	2714	102 32 8	2700
9	Fomalhaut	W.	80 22 14	2935	81 53 48	2919	83 25 43	2902	84 57 59	2887
	α Pegasi	W.	65 36 14	2995	67 6 33	2973	68 37 20	2951	70 8 34	2930
	α Arietis	W.	23 10 9	3688	24 27 9	3547	25 46 41	3429	27 8 25	3327

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	**Sun**	W.	72° 41′ 54″	3438	74° 3′ 27″	3445	75° 24′ 53″	3451	76° 46′ 12″	3456
	Mars	W.	39 55 14	3365	41 18 10	3369	42 41 2	3372	44 3 50	3376
	α Arietis	E.	73 43 5	3188	72 16 41	3196	70 50 27	3204	69 24 23	3212
	Aldebaran	E.	105 44 37	3033	104 15 5	3039	102 45 41	3045	101 16 23	3050
2	**Sun**	W.	83 31 33	3474	84 52 26	3476	86 13 17	3478	87 34 6	3478
	Mars	W.	50 56 59	3387	52 19 30	3388	53 42 0	3390	55 4 28	3390
	α Aquilæ	W.	43 58 3	4200	45 6 29	4145	46 15 47	4095	47 25 54	4047
	α Arietis	E.	62 16 23	3251	60 51 14	3258	59 26 13	3265	58 1 21	3273
	Aldebaran	E.	93 51 15	3067	92 22 25	3069	90 53 37	3070	89 24 51	3071
3	**Sun**	W.	94 18 7	3476	95 38 58	3473	96 59 52	3471	98 20 48	3468
	Mars	W.	61 56 59	3383	63 19 35	3380	64 42 14	3378	66 4 56	3374
	α Aquilæ	W.	53 26 58	3859	54 40 59	3829	55 55 31	3800	57 10 33	3773
	α Arietis	E.	50 59 14	3313	49 35 17	3321	48 11 30	3331	46 47 54	3341
	Aldebaran	E.	82 1 7	3069	80 32 19	3067	79 3 29	3065	77 34 36	3061
4	**Sun**	W.	105 6 34	3445	106 28 0	3438	107 49 33	3431	109 11 14	3424
	Mars	W.	72 59 41	3348	74 22 57	3342	75 46 20	3335	77 9 51	3327
	α Aquilæ	W.	63 32 24	3655	64 49 59	3635	66 7 56	3614	67 26 15	3595
	α Arietis	E.	39 53 17	3410	38 31 12	3430	37 9 29	3452	35 48 11	3478
	Aldebaran	E.	70 9 3	3039	68 39 39	3033	67 10 7	3027	65 40 28	3020
5	**Sun**	W.	116 1 48	3383	117 24 24	3373	118 47 11	3363	120 10 10	3353
	Mars	W.	84 9 47	3284	85 34 17	3274	86 58 59	3263	88 23 54	3253
	α Aquilæ	W.	74 2 53	3506	75 23 10	3490	76 43 45	3474	78 4 38	3458
	Fomalhaut	W.	40 47 1	3733	42 3 13	3681	43 20 20	3633	44 38 19	3587
	Aldebaran	E.	58 9 56	2981	56 39 19	2971	55 8 30	2962	53 37 29	2952
6	**Sun**	W.	127 8 6	3297	128 32 21	3285	129 56 50	3273	131 21 33	3261
	α Aquilæ	W.	84 53 19	3386	86 15 52	3372	87 38 40	3359	89 1 43	3347
	Fomalhaut	W.	51 19 39	3399	52 41 57	3367	54 4 51	3337	55 28 20	3306
	α Pegasi	W.	37 44 4	3788	38 59 19	3718	40 15 47	3654	41 33 23	3595
	Aldebaran	E.	45 59 9	2898	44 26 47	2885	42 54 9	2873	41 21 16	2861
	Saturn	E.	89 26 11	2883	87 53 30	2871	86 20 34	2859	84 47 22	2847
	Pollux	E.	90 1 30	2962	88 30 30	2950	86 59 15	2939	85 27 45	2926
7	Fomalhaut	W.	62 33 57	3176	64 0 35	3153	65 27 41	3129	66 55 15	3107
	α Pegasi	W.	48 16 3	3357	49 39 9	3319	51 2 59	3282	52 27 32	3247
	Aldebaran	E.	33 32 48	2797	31 58 16	2783	30 23 26	2769	28 48 18	2756
	Saturn	E.	76 57 22	2782	75 22 31	2769	73 47 23	2756	72 11 57	2741
	Pollux	E.	77 46 21	2864	76 13 16	2852	74 39 56	2840	73 6 20	2827
8	Fomalhaut	W.	74 19 35	3005	75 49 41	2987	77 20 10	2969	78 51 1	2952
	α Pegasi	W.	59 40 0	3095	61 8 16	3069	62 37 4	3043	64 6 24	3018
	Saturn	E.	64 10 13	2673	62 32 57	2660	60 55 23	2646	59 17 30	2632
	Pollux	E.	65 14 14	2766	63 39 1	2754	62 3 33	2742	60 27 49	2732
	Regulus	E.	100 55 28	2686	99 18 30	2672	97 41 13	2658	96 3 37	2645
9	Fomalhaut	W.	86 30 35	2873	88 3 29	2859	89 36 41	2845	91 10 10	2833
	α Pegasi	W.	71 40 15	2910	73 12 21	2891	74 44 51	2873	76 17 44	2856
	α Arietis	W.	28 32 5	3239	29 57 28	3162	31 24 23	3094	32 52 40	3034

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
9	SATURN	E.	57° 39′ 19″	2618	56° 0′ 49″	2605	54° 22′ 1″	2592	52° 42′ 55″	2579
	Pollux	E.	58 51 51	2720	57 15 38	2710	55 39 11	2700	54 2 31	2691
	Regulus	E.	94 25 43	2631	92 47 30	2617	91 8 58	2603	89 30 7	2589
10	Fomalhaut	W.	92 43 55	2821	94 17 56	2809	95 52 12	2798	97 26 42	2789
	α Pegasi	W.	77 50 59	2839	79 24 36	2823	80 58 34	2807	82 32 53	2792
	α Arietis	W.	34 22 11	2980	35 52 49	2932	37 24 27	2888	38 57 1	2849
	SATURN	E.	44 22 57	2516	42 42 6	2504	41 0 58	2492	39 19 34	2481
	Pollux	E.	45 56 18	2653	44 18 35	2649	42 40 46	2646	41 2 53	2644
	Regulus	E.	81 11 15	2524	79 30 35	2511	77 49 37	2498	76 8 21	2486
11	α Arietis	W.	46 51 19	2694	48 28 7	2670	50 5 27	2648	51 43 17	2626
	SATURN	E.	30 48 51	2433	29 6 3	2424	27 23 3	2417	25 39 53	2412
	Regulus	E.	67 37 52	2429	65 54 59	2419	64 11 51	2408	62 28 28	2398
12	α Arietis	W.	59 59 2	2541	61 39 18	2527	63 19 54	2514	65 0 48	2502
	Aldebaran	W.	26 20 2	2354	28 4 43	2346	29 49 36	2339	31 34 39	2331
	Regulus	E.	53 48 9	2354	52 3 28	2346	50 18 35	2338	48 33 31	2331
	Spica	E.	107 25 55	2380	105 41 51	2371	103 57 34	2363	102 13 6	2355
13	α Arietis	W.	73 29 8	2454	75 11 26	2446	76 53 55	2440	78 36 33	2433
	Aldebaran	W.	40 22 23	2300	42 8 22	2296	43 54 27	2291	45 40 39	2287
	Regulus	E.	39 45 49	2302	37 59 52	2296	36 13 47	2292	34 27 36	2287
	Spica	E.	93 28 17	2324	91 42 53	2320	89 57 22	2315	88 11 44	2311
	JUPITER	E.	100 48 11	2360	99 3 39	2355	97 18 59	2350	95 34 12	2346
14	α Arietis	W.	87 11 35	2413	88 54 51	2410	90 38 11	2409	92 21 33	2408
	Aldebaran	W.	54 33 3	2271	56 19 45	2268	58 6 31	2267	59 53 19	2266
	Spica	E.	79 22 17	2296	77 36 12	2294	75 50 4	2293	74 3 54	2291
	JUPITER	E.	86 48 55	2330	85 3 39	2327	83 18 19	2325	81 32 56	2324
	SUN	E.	139 36 8	2629	137 57 52	2624	136 19 30	2621	134 41 3	2617
15	Aldebaran	W.	68 47 43	2262	70 34 38	2262	72 21 33	2263	74 8 27	2264
	Pollux	W.	26 30 4	2585	28 9 20	2550	29 49 24	2521	31 30 8	2497
	SATURN	W.	26 1 47	2271	27 48 29	2268	29 35 16	2265	31 22 7	2263
	Spica	E.	65 12 50	2291	63 26 38	2293	61 40 28	2295	59 54 21	2297
	JUPITER	E.	72 45 38	2321	71 0 9	2321	69 14 40	2322	67 29 12	2323
	SUN	E.	126 27 51	2607	124 49 6	2607	123 10 20	2606	121 31 33	2605
16	Aldebaran	W.	83 2 36	2270	84 49 19	2272	86 36 0	2274	88 22 38	2277
	SATURN	W.	40 16 43	2263	42 3 37	2264	43 50 30	2265	45 37 21	2266
	Pollux	W.	40 0 39	2423	41 43 41	2415	43 26 54	2408	45 10 17	2402
	Spica	E.	51 4 36	2311	49 18 53	2315	47 33 16	2320	45 47 46	2325
	JUPITER	E.	58 42 19	2331	56 57 4	2333	55 11 52	2335	53 26 44	2337
	SUN	E.	113 17 46	2610	111 39 5	2612	110 0 26	2614	108 21 50	2615
17	Aldebaran	W.	97 14 50	2290	99 1 4	2294	100 47 13	2297	102 33 17	2300
	SATURN	W.	54 30 55	2278	56 17 27	2280	58 3 56	2283	59 50 21	2286
	Pollux	W.	53 48 49	2388	55 32 41	2387	57 16 35	2386	59 0 30	2386
	Regulus	W.	17 7 41	2293	18 53 51	2296	20 39 57	2298	22 25 59	2302
	Spica	E.	37 2 24	2361	35 17 53	2370	33 33 35	2381	31 49 33	2393
	JUPITER	E.	44 42 8	2355	42 57 29	2359	41 12 55	2364	39 28 28	2368

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
9	Saturn	E.	51 3 31	2566	49 23 49	2553	47 43 49	2540	46 3 32	2527
	Pollux	E.	52 25 39	2682	50 48 35	2673	49 11 19	2666	47 33 53	2659
	Regulus	E.	87 50 57	2576	86 11 29	2562	84 31 42	2549	82 51 37	2537
10	Fomalhaut	W.	99 1 24	2780	100 36 18	2771	102 11 24	2763	103 46 40	2756
	α Pegasi	W.	84 7 31	2779	85 42 26	2766	87 17 38	2754	88 53 6	2742
	α Arietis	W.	40 30 25	2813	42 4 36	2779	43 39 31	2749	45 15 6	2720
	Saturn	E.	37 37 54	2470	35 55 59	2460	34 13 50	2450	32 31 27	2441
	Pollux	E.	39 24 58	2643	37 47 2	2645	36 9 8	2649	34 31 19	2656
	Regulus	E.	74 26 48	2474	72 44 58	2462	71 2 52	2451	69 20 30	2440
11	α Arietis	W.	53 21 36	2607	55 0 22	2588	56 39 33	2572	58 19 7	2556
	Saturn	E.	23 56 35	2407	22 13 10	2404	20 29 41	2403	18 46 10	2405
	Regulus	E.	60 44 51	2389	59 1 0	2380	57 16 56	2371	55 32 39	2362
12	α Arietis	W.	66 41 59	2490	68 23 26	2480	70 5 7	2471	71 47 1	2462
	Aldebaran	W.	33 19 53	2324	35 5 17	2318	36 50 50	2312	38 36 32	2306
	Regulus	E.	46 48 17	2324	45 2 53	2318	43 17 20	2312	41 31 38	2307
	Spica	E.	100 28 27	2348	98 43 38	2342	96 58 40	2336	95 13 33	2330
13	α Arietis	W.	80 19 20	2428	82 2 15	2424	83 45 16	2419	85 28 23	2416
	Aldebaran	W.	47 26 57	2283	49 13 21	2280	50 59 50	2277	52 46 24	2273
	Regulus	E.	32 41 18	2284	30 54 55	2281	29 8 27	2277	27 21 54	2274
	Spica	E.	86 26 1	2307	84 40 12	2304	82 54 18	2300	81 8 19	2298
	Jupiter	E.	93 49 19	2342	92 4 20	2338	90 19 16	2335	88 34 8	2332
14	α Arietis	W.	94 4 56	2408	95 48 20	2408	97 31 44	2408	99 15 8	2409
	Aldebaran	W.	61 40 9	2264	63 27 1	2264	65 13 54	2263	67 0 48	2262
	Spica	E.	72 17 42	2291	70 31 29	2291	68 45 16	2291	66 59 3	2291
	Jupiter	E.	79 47 31	2322	78 2 4	2322	76 16 36	2321	74 31 7	2321
	Sun	E.	133 2 31	2614	131 23 55	2612	129 45 16	2610	128 6 34	2609
15	Aldebaran	W.	75 55 20	2264	77 42 12	2266	79 29 2	2267	81 15 50	2268
	Pollux	W.	33 11 25	2477	34 53 10	2460	36 35 20	2445	38 17 51	2433
	Saturn	W.	33 9 1	2262	34 55 56	2262	36 42 52	2262	38 29 48	2262
	Spica	E.	58 8 17	2299	56 22 16	2301	54 36 18	2304	52 50 25	2307
	Jupiter	E.	65 43 46	2324	63 58 21	2325	62 12 58	2326	60 27 37	2328
	Sun	E.	119 52 45	2606	118 13 58	2607	116 35 12	2608	114 56 28	2610
16	Aldebaran	W.	90 9 12	2279	91 55 42	2281	93 42 9	2284	95 28 32	2287
	Saturn	W.	47 24 10	2268	49 10 56	2270	50 57 39	2272	52 44 19	2275
	Pollux	W.	46 53 49	2397	48 37 28	2394	50 21 12	2391	52 4 59	2389
	Spica	E.	44 2 23	2331	42 17 8	2337	40 32 3	2344	38 47 8	2352
	Jupiter	E.	51 41 39	2341	49 56 39	2344	48 11 44	2347	46 26 53	2351
	Sun	E.	106 43 16	2618	105 4 46	2621	103 26 19	2624	101 47 56	2626
17	Aldebaran	W.	104 19 17	2303	106 5 12	2307	107 51 1	2311	109 36 45	2314
	Saturn	W.	61 36 41	2289	63 22 56	2292	65 9 7	2296	66 55 13	2300
	Pollux	W.	60 44 25	2387	62 28 19	2387	64 12 12	2389	65 56 2	2391
	Regulus	W.	24 11 56	2305	25 57 48	2308	27 43 36	2311	29 29 19	2315
	Spica	E.	30 5 48	2407	28 22 23	2423	26 39 21	2442	24 56 46	2464
	Jupiter	E.	37 44 7	2373	35 59 53	2378	34 15 47	2384	32 31 49	2390

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
17	Sun	E.	100° 9′ 37″	2629	98° 31′ 22″	2632	96° 53′ 11″	2636	95° 15′ 5″	2640
18	Saturn	W.	68 41 13	2303	70 27 8	2307	72 12 57	2311	73 58 41	2315
	Pollux	W.	67 39 50	2393	69 23 35	2395	71 7 17	2397	72 50 56	2400
	Regulus	W.	31 14 56	2319	33 0 28	2323	34 45 54	2327	36 31 14	2331
	Jupiter	E.	30 48 0	2396	29 4 20	2403	27 20 50	2412	25 37 32	2420
	Sun	E.	87 5 49	2659	85 28 14	2663	83 50 44	2667	82 13 20	2672
19	Saturn	W.	82 45 52	2336	84 30 59	2340	86 16 0	2345	88 0 54	2349
	Pollux	W.	81 28 3	2417	83 11 13	2422	84 54 17	2426	86 37 15	2430
	Regulus	W.	45 16 24	2353	47 1 7	2357	48 45 44	2362	50 30 14	2366
	Sun	E.	74 7 56	2696	72 31 11	2701	70 54 32	2706	69 18 0	2712
20	Pollux	W.	95 10 24	2455	96 52 40	2462	98 34 47	2467	100 16 46	2474
	Regulus	W.	59 10 59	2391	60 54 46	2396	62 38 26	2402	64 21 58	2407
	Sun	E.	61 17 14	2741	59 41 28	2747	58 5 50	2753	56 30 20	2760
21	Regulus	W.	72 57 40	2436	74 40 23	2442	76 22 58	2448	78 5 24	2455
	Spica	W.	20 7 23	2633	21 45 33	2612	23 24 11	2596	25 3 11	2585
	Sun	E.	48 35 4	2795	47 0 29	2802	45 26 4	2811	43 51 50	2818
22	Regulus	W.	86 35 14	2489	88 16 43	2496	89 58 2	2503	91 39 11	2511
	Spica	W.	33 20 45	2566	35 0 26	2567	36 40 6	2569	38 19 43	2572
	Sun	E.	36 3 28	2866	34 30 25	2876	32 57 35	2887	31 25 0	2899
26	Sun	W.	13 14 16	3366	14 37 11	3338	16 0 38	3320	17 24 26	3310
	Fomalhaut	E.	50 13 41	3318	48 49 50	3355	47 26 42	3394	46 4 19	3437
	α Pegasi	E.	64 45 30	3173	63 18 48	3194	61 52 32	3217	60 26 43	3240
27	Sun	W.	24 24 53	3309	25 48 54	3313	27 12 50	3319	28 36 39	3325
	Fomalhaut	E.	39 25 36	3709	38 8 58	3779	36 53 34	3856	35 39 29	3941
	α Pegasi	E.	53 25 1	3378	52 2 19	3410	50 40 14	3444	49 18 47	3480
	α Arietis	E.	95 32 13	3014	94 2 18	3024	92 32 35	3034	91 3 4	3044
28	Sun	W.	35 33 50	3361	36 56 51	3369	38 19 43	3376	39 42 27	3384
	α Pegasi	E.	42 42 36	3706	41 25 55	3762	40 10 13	3822	38 55 34	3889
	α Arietis	E.	83 38 35	3094	82 10 18	3104	80 42 13	3114	79 14 20	3124
29	Sun	W.	46 33 59	3419	47 55 54	3426	49 17 41	3431	50 39 22	3436
	α Aquilæ	W.	36 55 59	4733	37 56 31	4626	38 58 33	4530	40 1 59	4444
	α Arietis	E.	71 57 56	3173	70 31 15	3183	69 4 46	3193	67 38 29	3203
	Aldebaran	E.	103 51 58	3012	102 22 0	3018	100 52 10	3025	99 22 28	3031
30	Sun	W.	57 26 12	3463	58 47 18	3466	60 8 20	3470	61 29 18	3472
	α Aquilæ	W.	45 36 13	4124	46 45 52	4077	47 56 16	4034	49 7 22	3993
	α Arietis	E.	60 29 57	3252	59 4 49	3263	57 39 54	3273	56 15 11	3283
	Aldebaran	E.	91 55 46	3057	90 26 44	3061	88 57 47	3064	87 28 53	3067
31	Sun	W.	68 13 30	3480	69 34 16	3480	70 55 2	3480	72 15 48	3480
	α Aquilæ	W.	55 11 51	3836	56 26 16	3811	57 41 7	3788	58 56 22	3765
	α Arietis	E.	49 14 44	3341	47 51 20	3354	46 28 11	3367	45 5 17	3380
	Aldebaran	E.	80 5 12	3076	78 36 33	3077	77 7 55	3077	75 39 17	3076

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
17	Sun	E.	93° 37′ 4″	2643	91° 59′ 8″	2646	90° 21′ 16″	2651	88° 43′ 30″	2655
18	Saturn	W.	75 44 19	2318	77 29 52	2322	79 15 19	2327	81 0 39	2332
	Pollux	W.	74 34 31	2403	76 18 1	2406	78 1 27	2410	79 44 48	2414
	Regulus	W.	38 16 28	2335	40 1 36	2339	41 46 38	2344	43 31 34	2348
	Jupiter	E.	23 54 26	2431	22 11 35	2442	20 29 0	2455	18 46 44	2472
	Sun	E.	80 36 3	2677	78 58 52	2681	77 21 47	2686	75 44 48	2691
19	Saturn	W.	89 45 42	2354	91 30 23	2359	93 14 57	2364	94 59 23	2369
	Pollux	W.	88 20 7	2435	90 2 52	2440	91 45 30	2445	93 28 1	2450
	Regulus	W.	52 14 37	2371	53 58 53	2376	55 43 2	2381	57 27 4	2386
	Sun	E.	67 41 36	2717	66 5 19	2723	64 29 10	2729	62 53 8	2735
20	Pollux	W.	101 58 36	2480	103 40 17	2487	105 21 49	2493	107 3 12	2500
	Regulus	W.	66 5 23	2412	67 48 40	2419	69 31 48	2424	71 14 48	2430
	Sun	E.	54 54 59	2766	53 19 46	2772	51 44 42	2780	50 9 48	2788
21	Regulus	W.	79 47 41	2461	81 29 49	2468	83 11 47	2475	84 53 35	2482
	Spica	W.	26 42 26	2577	28 21 52	2572	30 1 26	2568	31 41 5	2567
	Sun	E.	42 17 46	2828	40 43 54	2836	39 10 13	2845	37 36 44	2855
22	Regulus	W.	93 20 9	2518	95 0 57	2526	96 41 34	2534	98 22 0	2543
	Spica	W.	39 59 17	2575	41 38 46	2580	43 18 9	2585	44 57 25	2591
	Sun	E.	29 52 40	2912	28 20 36	2926	26 48 50	2941	25 17 23	2957
26	Sun	W.	18 48 26	3305	20 12 32	3303	21 36 40	3303	23 0 48	3306
	Fomalhaut	E.	44 42 44	3483	43 22 1	3532	42 2 12	3586	40 43 22	3645
	α Pegasi	E.	59 1 21	3265	57 36 28	3291	56 12 6	3319	54 48 17	3348
27	Sun	W.	30 0 21	3332	31 23 56	3338	32 47 23	3346	34 10 41	3354
	Fomalhaut	E.	34 26 51	4038	33 15 49	4144	32 6 30	4263	30 59 3	4398
	α Pegasi	E.	47 58 1	3519	46 37 58	3561	45 18 41	3606	44 0 13	3653
	α Arietis	E.	89 33 46	3054	88 4 40	3064	86 35 46	3073	85 7 4	3084
28	Sun	W.	41 5 2	3391	42 27 29	3399	43 49 47	3406	45 11 57	3413
	α Pegasi	E.	37 42 3	3963	36 29 47	4044	35 18 51	4134	34 9 22	4235
	α Arietis	E.	77 46 39	3134	76 19 11	3143	74 51 54	3153	73 24 49	3163
29	Sun	W.	52 0 56	3443	53 22 24	3448	54 43 46	3454	56 5 2	3459
	α Aquilæ	W.	41 6 41	4366	42 12 33	4296	43 19 29	4233	44 27 24	4176
	α Arietis	E.	66 12 23	3213	64 46 29	3223	63 20 47	3232	61 55 16	3242
	Aldebaran	E.	97 52 54	3037	96 23 27	3043	94 54 7	3047	93 24 53	3053
30	Sun	W.	62 50 13	3475	64 11 5	3477	65 31 55	3479	66 52 43	3480
	α Aquilæ	W.	50 19 8	3957	51 31 30	3923	52 44 26	3892	53 57 54	3863
	α Arietis	E.	54 50 40	3294	53 26 21	3305	52 2 15	3317	50 38 23	3328
	Aldebaran	E.	86 0 3	3069	84 31 16	3072	83 2 32	3074	81 33 51	3076
31	Sun	W.	73 36 35	3478	74 57 24	3476	76 18 15	3474	77 39 8	3471
	α Aquilæ	W.	60 12 1	3744	61 28 2	3794	62 44 24	3704	64 1 7	3686
	α Arietis	E.	43 42 40	3399	42 20 22	3416	40 58 24	3435	39 36 47	3455
	Aldebaran	E.	74 10 38	3075	72 41 58	3073	71 13 16	3072	69 44 32	3069

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	17 16 3.38	+ 4.261	−20 21 37.5	−22.26	22 29.9	1	19 56 37.56	+16.495	−22 10 30.7	+ 31.80	23 12.7
2	17 18 0.23	5.456	20 31 3.0	24.75	22 28.4	2	20 3 12.63	16.497	21 57 7.1	35.18	23 15.4
3	17 20 24.40	6.539	20 41 21.1	26.65	22 27.2	3	20 9 49.36	16.563	21 42 22.1	38.58	23 18.1
4	17 23 13.26	7.516	20 52 17.6	27.98	22 26.4	4	20 16 27.63	16.624	21 26 15.2	42.00	23 20.8
5	17 26 24.41	8.398	21 3 39.9	28.80	22 26.0	5	20 23 7.30	16.681	21 8 45.9	45.45	23 23.6
6	17 29 55.67	+ 9.193	−21 15 16.1	−29.15	22 25.9	6	20 29 48.29	+16.734	−20 49 53.6	+ 48.92	23 26.3
7	17 33 45.05	9.909	21 26 55.6	29.08	22 26.0	7	20 36 30.50	16.783	20 29 37.9	52.40	23 29.1
8	17 37 50.73	10.554	21 38 29.0	28.65	22 26.4	8	20 43 13.85	16.829	20 7 58.4	55.90	23 31.9
9	17 42 11.14	11.137	21 49 47.9	27.86	22 27.0	9	20 49 58.28	16.872	19 44 54.6	59.41	23 34.7
10	17 46 44.87	11.664	22 0 44.8	26.81	22 27.8	10	20 56 43.70	16.913	19 20 26.3	62.94	23 37.6
11	17 51 30.62	+12.141	−22 11 12.8	−25.48	22 28.8	11	21 3 30.09	+16.952	−18 54 33.3	+ 66.48	23 40.4
12	17 56 27.25	12.573	22 21 6.0	23.92	22 29.9	12	21 10 17.41	16.990	18 27 15.2	70.03	23 43.3
13	18 1 33.76	12.965	22 30 19.3	22.15	22 31.2	13	21 17 5.60	17.026	17 58 31.8	73.59	23 46.2
14	18 6 49.28	13.322	22 38 47.9	20.20	22 32.7	14	21 23 54.64	17.061	17 28 23.0	77.15	23 49.1
15	18 12 12.98	13.647	22 46 27.7	18.08	22 34.2	15	21 30 44.51	17.095	16 56 48.8	80.70	23 52.0
16	18 17 44.11	+13.943	−22 53 14.8	−15.82	22 35.9	16	21 37 35.20	+17.129	−16 23 49.2	+ 84.26	23 54.9
17	18 23 22.05	14.215	22 59 6.0	13.43	22 37.7	17	21 44 26.70	17.162	15 49 24.3	87.82	23 57.8
18	18 29 6.23	14.463	23 3 58.1	10.91	22 39.6	18	21 51 18.99	17.195	15 13 34.1	91.36	
19	18 34 56.12	14.691	23 7 48.7	8.29	22 41.6	19	21 58 12.06	17.228	14 36 19.0	94.89	0 0.8
20	18 40 51.26	14.900	23 10 35.4	5.58	22 43.7	20	22 5 5.91	17.260	13 57 39.3	98.40	0 3.7
21	18 46 51.20	+15.092	−23 12 16.0	− 2.78	22 45.8	21	22 12 0.51	+17.291	−13 17 35.8	+101.88	0 6.7
22	18 52 55.57	15.269	23 12 48.4	+ 0.09	22 48.0	22	22 18 55.83	17.320	12 36 9.2	105.33	0 9.7
23	18 59 4.01	15.432	23 12 11.0	3.04	22 50.2	23	22 25 51.85	17.348	11 53 20.6	108.72	0 12.7
24	19 5 16.20	15.582	23 10 22.2	6.04	22 52.5	24	22 32 48.52	17.373	11 9 11.1	112.05	0 15.7
25	19 11 31.83	15.719	23 7 20.5	9.11	22 54.9	25	22 39 45.76	17.395	10 23 42.8	115.30	0 18.7
26	19 17 50.64	+15.846	−23 3 4.5	+12.23	22 57.4	26	22 46 43.45	+17.412	− 9 36 57.4	+118.46	0 21.7
27	19 24 12.38	15.964	22 57 33.2	15.39	22 59.8	27	22 53 41.47	17.422	8 48 57.3	121.51	0 24.8
28	19 30 36.82	16.072	22 50 45.4	18.60	23 2.3	28	23 0 39.66	17.425	7 59 46.0	124.41	0 27.8
29	19 37 3.74	16.171	22 42 40.2	21.85	23 4.9	29	23 7 37.78	17.417	7 9 27.1	127.14	0 30.9
30	19 43 32.95	16.262	22 33 16.5	25.13	23 7.5	30	23 14 35.55	17.395	6 18 4.9	129.67	0 33.9
31	19 50 4.28	+16.347	−22 22 33 6	+28.45	23 10.1	31	23 21 32.61	+17.357	− 5 25 44.7	+131.96	0 36.9
32	19 56 37.56	+16.495	−22 10 30.7	+31.80	23 12.7	32	23 28 28.51	+17.298	− 4 32 32.8	+133.97	0 39.9

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	3″.9	3″.5	3″.1	2″.9	2″.7	2″.6	2″.5
Hor. Parallax . .	10 3	9.1	8.3	7.7	7.3	7.0	6.7

Day of the Month.	5th.	10th.	15th.	20th.	25th.
Semidiameter.	2″.5	2″.4	2″.4	2″.4	2″.4
Horizontal Parallax . .	6.5	6.4	6.4	6.4	6.5

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	23 7 37.78	+17.417	− 7 9 27.1	+127.14	0 30.9	1	1 22 32.17	−2.396	+12 15 30.0	−18.22	0 43.3
2	23 14 35.55	17.395	6 18 4.9	129.67	0 33.9	2	1 21 24.12	3.262	12 6 17.7	27.75	0 38.2
3	23 21 32.61	17.357	5 25 44.7	131.96	0 36.9	3	1 19 56.32	4.039	11 53 21.6	36.84	0 32.8
4	23 28 28.51	17.298	4 32 32.8	133.97	0 39.9	4	1 18 11.06	4.714	11 36 53.9	45.36	0 27.1
5	23 35 22.74	17.216	3 38 36.4	135.66	0 42.8	5	1 16 10.94	5.277	11 17 10.0	53.16	0 21.2
6	23 42 14.66	+17.105	− 2 44 3.9	+136.98	0 45.7	6	1 13 58.74	−5.719	+10 54 29.0	−60.10	0 15.1
7	23 49 3.53	16.961	1 49 4.9	137.87	0 48.6	7	1 11 37.46	6.032	10 29 13.0	66.05	0 8.9
8	23 55 48.46	16.777	− 0 53 50.2	138.28	0 51.4	8	1 9 10.24	6.215	10 1 47.0	70.92	0 2.5 23 56.1
9	0 2 28.48	16.550	+ 0 1 28.2	138.16	0 54.2	9	1 6 40.19	6.268	9 32 38.1	74.62	23 49.7
10	0 9 2.48	16.274	0 56 37.1	137.48	0 56.8	10	1 4 10.42	6.192	9 2 15.2	77.08	23 43.3
11	0 15 29.21	+15.944	+ 1 51 22.1	+136.16	0 59.3	11	1 1 43.92	−5.997	+ 8 31 7.9	−78.32	23 37.0
12	0 21 47.32	15.555	2 45 27.8	134.20	1 1.6	12	0 59 23.45	5.692	7 59 45.4	78.35	23 30.9
13	0 27 55.36	15.104	3 38 38.2	131.55	1 3.8	13	0 57 11.52	5.287	7 28 36.1	77.23	23 25.0
14	0 33 51.81	14.588	4 30 36.8	128.21	1 5.8	14	0 55 10.35	4.796	6 58 6.9	75.04	23 19.3
15	0 39 35.07	14.006	5 21 6.5	124.15	1 7.6	15	0 53 21.88	4.232	6 28 42.1	71.88	23 13.8
16	0 45 3.55	+13.356	+ 6 9 50.6	+119.41	1 9.1	16	0 51 47.68	−3.609	+ 6 0 43.5	−67.88	23 8.5
17	0 50 15.63	12.640	6 56 32.9	114.00	1 10.4	17	0 50 29.00	2.941	5 34 29.8	63.16	23 3.5
18	0 55 9.75	11.860	7 40 57.5	107.95	1 11.3	18	0 49 26.78	2.240	5 10 16.6	57.85	22 58.8
19	0 59 44.40	11.018	8 22 49.5	101.29	1 11.9	19	0 48 41.65	1.518	4 48 16.5	52.09	22 54.4
20	1 3 58.17	10.120	9 1 54.8	94.06	1 12.2	20	0 48 14.03	0.784	4 28 39.1	45.98	22 50.3
21	1 7 49.75	+ 9.170	+ 9 38 0.5	+ 86.33	1 12.1	21	0 48 4.07	−0.047	+ 4 11 31.2	−39.64	22 46.5
22	1 11 17.97	8.174	10 10 55.0	78.14	1 11.6	22	0 48 11.73	+0.684	3 56 57.5	33.16	22 43.0
23	1 14 21.79	7.139	10 40 27.6	69.52	1 10.7	23	0 48 36.81	1.404	3 45 0.2	26.62	22 39.7
24	1 17 0.39	6.073	11 6 28.7	60.52	1 9.4	24	0 49 19.02	2.110	3 35 40.0	20.08	22 36.8
25	1 19 13.12	4.984	11 28 49.8	51.19	1 7.7	25	0 50 17.94	2.797	3 28 56.1	13.62	22 34.1
26	1 20 59.53	+ 3.881	+11 47 23.8	+ 41.60	1 5.5	26	0 51 33.09	+3.462	+ 3 24 46.4	− 7.23	22 31.6
27	1 22 19.38	2.774	12 2 4.7	31.78	1 2.9	27	0 53 3.95	4.105	3 23 8.0	− 1.00	22 29.4
28	1 23 12.73	1.674	12 12 48.0	21.80	0 59.8	28	0 54 49.96	4.725	3 23 57.1	+ 5.07	22 27.5
29	1 23 39.88	+ 0.594	12 19 30.5	11.73	0 56.3	29	0 56 50.54	5.320	3 27 9.7	10.95	22 25.8
30	1 23 41.49	− 0.453	12 22 10.8	+ 1.64	0 52.3	30	0 59 5.13	5.892	3 32 40.9	16.62	22 24.3
31	1 23 18.51	− 1.454	+12 20 49.6	− 8.38	0 48.0	31	1 1 33.19	+6.442	+ 3 40 25.8	+22.09	22 23.0
32	1 22 32.17	− 2.396	+12 15 30.0	− 18.22	0 43.3	32	1 4 14.17	+6.970	+ 3 50 19.6	+27.36	22 22.0

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter . . .	2″.5	2″.7	2″.9	3″.2	3″.7	4″.3	Semidiameter . .	6″.0	5″.5	5″.8	5″.7	5″.4	4″.9
Horizontal Parallax	6.7	7.1	7.7	8.6	9.9	11.5	Hor. Parallax . .	13.3	14.6	15.3	15.1	14.2	13.1

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

	MAY.					JUNE.					
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	1 1 33.19	+ 6.442	+ 3 40 25.8	+22.09	22 23.0	1	3 45 38.67	+20.136	+18 55 6.7	+91.65	23 10.1
2	1 4 14.17	6.970	3 50 19.6	27.36	22 22.0	2	3 53 47.86	20.630	19 31 22.2	89.57	23 14.5
3	1 7 7.57	7.477	4 2 17.2	32.41	22 21.1	3	4 2 8.80	21.114	20 6 42.2	87.02	23 19.2
4	1 10 12.91	7.965	4 16 13.5	37.25	22 20.4	4	4 10 41.18	21.582	20 40 55.0	83.97	23 24.0
5	1 13 29.76	8.436	4 32 3.5	41.88	22 19.9	5	4 19 24.55	22.028	21 13 48.6	80.41	23 28.9
6	1 16 57.73	+8.892	+ 4 49 42.2	+46.31	22 19.6	6	4 28 18.29	+22.445	+21 45 10.7	+76.34	23 34.0
7	1 20 36.46	9.333	5 9 4.9	50.54	22 19.5	7	4 37 21.62	22.826	22 14 48.9	71.76	23 39.3
8	1 24 25.63	9.762	5 30 6.7	54.58	22 19.5	8	4 46 33.58	23.163	22 42 31.1	66.68	23 44.7
9	1 28 24.97	10.181	5 52 43.0	58.42	22 19.7	9	4 55 53.04	23.450	23 8 6.0	61.14	23 50.2
10	1 32 34.24	10.590	6 16 49.3	62.08	22 20.1	10	5 5 18.74	23.681	23 31 23.0	55.19	23 55.8
11	1 36 53.24	+10.992	+ 6 42 21.2	+65.55	22 20.6	11	5 14 49.26	+23.852	+23 52 12.5	+48.88	
12	1 41 21.83	11.389	7 9 14.3	68.85	22 21.3	12	5 24 23.10	23.958	24 10 26.7	42.26	0 1.4
13	1 45 59.90	11.783	7 37 24.5	71.97	22 22.1	13	5 33 58.69	23.998	24 25 59.3	35.41	0 7.1
14	1 50 47.39	12.174	8 6 47.5	74.92	22 23.1	14	5 43 34.45	23.972	24 38 45.2	28.41	0 12.8
15	1 55 44.25	12.565	8 37 19.2	77.69	22 24.3	15	5 53 8.79	23.880	24 48 42.6	21.35	0 18.4
16	2 0 50.50	+12.956	+ 9 8 55.3	+80.29	22 25.6	16	6 2 40.20	+23.728	+24 55 50.1	+14.28	0 24.0
17	2 6 6.17	13.350	9 41 31.8	82.72	22 27.1	17	6 12 7.27	23.519	25 0 8.7	7.28	0 29.6
18	2 11 31.34	13.748	10 15 4.3	84.96	22 28.7	18	6 21 28.68	23.257	25 1 40.8	+ 0.42	0 35.0
19	2 17 6.11	14.151	10 49 28.5	87.02	22 30.5	19	6 30 43.22	22.948	25 0 30.3	− 6.26	0 40.3
20	2 22 50.62	14.560	11 24 40.0	88.90	22 32.4	20	6 39 49.85	22.598	24 56 42.2	12.70	0 45.5
21	2 28 45.04	+14.976	+12 0 34.2	+90.58	22 34.5	21	6 48 47.65	+22.214	+24 50 22.7	−18.88	0 50.5
22	2 34 49.54	15.400	12 37 6.3	92.06	22 36.8	22	6 57 35.87	21.800	24 41 38.2	24.77	0 55.4
23	2 41 4.34	15.835	13 14 11.1	93.31	22 39.3	23	7 6 13.86	21.362	24 30 36.2	30.34	1 0.1
24	2 47 29.68	16.278	13 51 43.2	94.33	22 42.0	24	7 14 41.10	20.905	24 17 24.4	35.59	1 4.6
25	2 54 5.79	16.732	14 29 36.8	95.10	22 44.8	25	7 22 57.18	20.433	24 2 10.5	40.51	1 9.0
26	3 0 52.92	+17.196	+15 7 45.8	+95.61	22 47.9	26	7 31 1.81	+19.951	+23 45 2.5	−45.10	1 13.1
27	3 7 51.30	17.670	15 46 3.6	95.82	22 51.1	27	7 38 54.76	19.460	23 26 8.3	49.36	1 17.0
28	3 15 1.16	18.153	16 24 22.7	95.72	22 54.5	28	7 46 35.87	18.965	23 5 35.6	53.29	1 20.8
29	3 22 22.69	18.643	17 2 35.3	95.28	22 58.1	29	7 54 5.05	18.467	22 43 32.9	56.91	1 24.4
30	3 29 56.07	19.139	17 40 33.0	94.47	23 1.9	30	8 1 22.26	17.968	22 20 6.7	60.22	1 27.7
31	3 37 41.39	+19.638	+18 18 6.8	+93.27	23 5.9	31	8 8 27.49	+17.468	+21 55 24.6	−63.24	1 30.8
32	3 45 38.67	+20.136	+18 55 6.7	+91.65	23 10.1	32	8 15 20.75	+16.970	+21 29 33.6	−65.96	1 33.7

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.	Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″	″		″	″	″	″	″	″
Semidiameter . .	4.5	4.1	3.7	3.4	3.1	2.9	2.7	Semidiameter . .	2.6	2.5	2.5	2.6	2.7	2.9
Hor. Parallax . .	11.9	10.8	9.8	9.0	8.3	7.7	7.2	Hor. Parallax . .	6.9	6.7	6.7	6.9	7.2	7.7

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	8 8 27.49	+17.468	+21 55 24.6	−63.24	1 30.8
2	8 15 20.75	16.970	21 29 33.6	65.96	1 33.7
3	8 22 2.07	16.474	21 2 40.7	68.40	1 36.5
4	8 28 31.51	15.981	20 34 52.4	70.58	1 39.1
5	8 34 49.16	15.490	20 6 15.0	72.50	1 41.4
6	8 40 55.04	+15.000	+19 36 54.6	−74.16	1 43.5
7	8 46 49.19	14.513	19 6 57.3	75.58	1 45.4
8	8 52 31.68	14.028	18 36 28.9	76.75	1 47.1
9	8 58 2.53	13.543	18 5 35.1	77.70	1 48.7
10	9 3 21.74	13.058	17 34 21.3	78.41	1 50.1
11	9 8 29.33	+12.574	+17 2 53.1	−78.91	1 51.3
12	9 13 25.26	12.087	16 31 15.6	79.18	1 52.3
13	9 18 9.47	11.597	15 59 34.3	79.23	1 53.1
14	9 22 41.90	11.105	15 27 54.5	79.05	1 53.7
15	9 27 2.46	10.606	14 56 21.5	78.66	1 54.0
16	9 31 11.01	+10.103	+14 25 0.6	−78.04	1 54.2
17	9 35 7.36	9.591	13 53 57.2	77.20	1 54.2
18	9 38 51.31	9.070	13 23 16.9	76.12	1 54.0
19	9 42 22.65	8.539	12 53 5.2	74.81	1 53.6
20	9 45 41.10	7.996	12 23 27.8	73.26	1 52.9
21	9 48 46.35	+ 7.439	+11 54 30.7	−71.46	1 52.0
22	9 51 38.06	6.867	11 26 20.1	69.39	1 50.9
23	9 54 15.85	6.279	10 59 2.3	67.05	1 49.6
24	9 56 39.31	5.673	10 32 44.1	64.43	1 48.0
25	9 58 48.01	5.048	10 7 32.2	61.52	1 46.2
26	10 0 41.46	+ 4.403	+ 9 43 33.9	−58.30	1 44.1
27	10 2 19.17	3.736	9 20 56.8	54.75	1 41.8
28	10 3 40.62	3.048	8 59 48.7	50.87	1 39.2
29	10 4 45.31	2.339	8 40 17.6	46.66	1 36.3
30	10 5 32.74	1.610	8 22 31.9	42.09	1 33.1
31	10 6 2.41	+ 0.861	+ 8 6 40.0	−37.17	1 29.6
32	10 6 13.89	+ 0.094	+ 7 52 50.5	−31.89	1 25.9

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	3″.1	3″.3	3″.6	4″.0	4″.3	4″.7
Hor. Parallax . .	8.2	8.9	9.6	10.5	11.5	12.5

AUGUST.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	10 6 13.89	+0.094	+ 7 52 50.5	−31.89	1 25.9
2	10 6 6.83	−0.685	7 41 12.0	26.26	1 21.9
3	10 5 40.95	1.473	7 31 52.6	20.30	1 17.5
4	10 4 56.10	2.264	7 25 0.3	14.00	1 12.8
5	10 3 52.34	3.048	7 20 42.7	7.42	1 7.8
6	10 2 29.90	−3.818	+ 7 19 5.9	− 0.61	1 2.5
7	10 0 49.27	4.562	7 20 14.8	+ 6.38	0 56.9
8	9 58 51.24	5.266	7 24 12.7	13.47	0 51.0
9	9 56 36.93	5.916	7 31 1.1	20.56	0 44.8
10	9 54 7.83	6.495	7 40 38.5	27.54	0 38.4
11	9 51 25.84	−6.968	+ 7 53 1.1	+34.29	0 31.8
12	9 48 33.20	7.360	8 8 1.7	40.68	0 25.0
13	9 45 32.55	7.652	8 25 29.8	46.57	0 18.1
14	9 42 26.95	7.798	8 45 12.1	51.83	0 11.1
15	9 39 19.71	7.787	9 6 51.6	56.33	0 4.0 23 57.0
16	9 36 14.40	−7.629	+ 9 30 8.8	+59.96	23 50.1
17	9 33 14.76	7.315	9 54 42.0	62.64	23 43.4
18	9 30 24.52	6.846	10 20 7.2	64.29	23 36.9
19	9 27 47.44	6.220	10 45 59.7	64.90	23 30.6
20	9 25 27.10	5.451	11 11 54.0	64.46	23 24.7
21	9 23 26.84	−4.549	+11 37 25.4	+62.98	23 19.1
22	9 21 49.69	3.598	12 2 9.3	60.52	23 14.0
23	9 20 38.28	2.407	12 25 42.7	57.12	23 9.3
24	9 19 54.82	−1.200	12 47 44.1	52.86	23 5.1
25	9 19 41.08	+0.067	13 7 53.6	47.82	23 1.4
26	9 19 59.34	+1.378	+13 25 53.5	+42.06	22 58.3
27	9 20 47.47	2.717	13 41 27.5	35.68	22 55.7
28	9 22 8.84	4.064	13 54 21.8	28.74	22 53.6
29	9 24 2.46	5.401	14 4 23.5	21.34	22 52.1
30	9 26 27.89	6.713	14 11 22.8	13.54	22 51.1
31	9 29 24.35	+7.985	+14 15 10.9	+ 5.42	22 50.6
32	9 32 50.73	+9.203	+14 15 41.0	− 2.94	22 50.5

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .	5″.1	5″.4	5″.5	5″.2	4″.7	4″.1
Hor. Parallax . .	13.6	14.4	14.5	13.8	12.4	10.8

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	9 32 50.73	+ 9.203	+14 15 41.0	− 2.94	22 50.5
2	9 36 45.58	10.356	14 12 48.4	11.46	22 50.9
3	9 41 7.21	11.433	14 6 30.1	20.06	22 51.7
4	9 45 53.68	12.495	13 56 45.5	28.65	22 52.9
5	9 51 2.90	13.396	13 43 35.9	37.13	22 54.5
6	9 56 32.60	+14.132	+13 27 4.7	− 45.43	22 56.3
7	10 2 20.46	14.839	13 7 17.2	53.46	22 58.4
8	10 8 24.09	15.447	12 44 21.2	61.14	23 0.8
9	10 14 41.15	15.958	12 18 25.8	68.40	23 3.3
10	10 21 9.36	16.377	11 49 41.7	75.19	23 6.0
11	10 27 46.54	+16.706	+11 18 20.7	− 81.47	23 8.8
12	10 34 30.70	16.959	10 44 35.6	87.20	23 11.7
13	10 41 20.00	17.138	10 8 39.5	92.38	23 14 6
14	10 48 12.81	17.252	9 30 45.8	97.00	23 17.6
15	10 55 7.67	17.311	8 51 7.9	101.07	23 20.5
16	11 2 3.36	+17.323	+ 8 9 58.7	−104.62	23 23.5
17	11 8 58.85	17.295	7 27 30.4	107.66	23 26.5
18	11 15 53.26	17.235	6 43 54.7	110.23	23 29.4
19	11 22 45.93	17.149	5 59 22.8	112.36	23 32.3
20	11 29 36.27	17.044	5 14 4.7	114.09	23 35.2
21	11 36 23.91	+16.924	+ 4 28 9.3	−115.46	23 38.0
22	11 43 8.55	16.794	3 41 45.3	116.49	23 40.8
23	11 49 49.97	16.657	2 55 0.2	117.22	23 43.5
24	11 56 28.06	16.516	2 8 1.0	117.67	23 46.1
25	12 3 2.75	16.376	1 20 53.8	117.88	23 48.7
26	12 9 34.05	+16.234	+ 0 33 44.1	−117.88	23 51.2
27	12 16 2.02	16.097	− 0 13 23.1	117.68	23 53.7
28	12 22 26.73	15.963	1 0 23.4	117.31	23 56.1
29	12 28 48.28	15.834	1 47 12.9	116.78	23 58.5
30	12 35 6.81	15.711	2 33 47.8	116.11	
31	12 41 22.44	+15.593	− 3 20 5.1	−115.31	0 0.8
32	12 47 35.34	+15.483	− 4 6 1.9	−114.40	0 3.1

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	3″.5	3″.1	2″.7	2″.6	2″.5	2″.4
Hor. Parallax . .	9.2	8.1	7.3	6.8	6.5	6.3

OCTOBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	12 41 22.44	+15.593	− 3 20 5.1	−115.31	0 0.8
2	12 47 35.34	15.483	4 6 1.9	114.40	0 3.1
3	12 53 45.67	15.379	4 51 35.7	113.39	0 5.3
4	12 59 53.61	15.283	5 36 44.0	112.26	0 7.5
5	13 5 59.32	15.194	6 21 24.7	111.10	0 9.7
6	13 12 2.98	+15.112	− 7 5 36.0	−109.83	0 11.8
7	13 18 4.76	15.037	7 49 15.9	108.48	0 13.9
8	13 24 4.80	14.968	8 32 22.8	107.08	0 15.9
9	13 30 3.28	14.906	9 14 55.1	105.61	0 18.0
10	13 36 0.36	14.851	9 56 51.4	104.08	0 20.0
11	13 41 56.19	+14.802	−10 38 10.3	−102.49	0 22.0
12	13 47 50.90	14.758	11 18 50.5	100.85	0 24.0
13	13 53 44.63	14.720	11 58 50.6	99.15	0 25.9
14	13 59 37.51	14.687	12 38 9.4	97.41	0 27.8
15	14 5 29.66	14.659	13 16 45.7	95.62	0 29.8
16	14 11 21.19	+14.635	−13 54 38.3	− 93.77	0 31.7
17	14 17 12.18	14.615	14 31 46.0	91.87	0 33.6
18	14 23 2.71	14.597	15 8 7.6	89.92	0 35.5
19	14 28 52.84	14.582	15 43 41.9	87.92	0 37.4
20	14 34 42.65	14.569	16 18 27.5	85.87	0 39.3
21	14 40 32.16	+14.557	−16 52 23.3	− 83.77	0 41.2
22	14 46 21.40	14.546	17 25 28.0	81.61	0 43.0
23	14 52 10.35	14.534	17 57 40.2	79.40	0 44.9
24	14 57 59.00	14.521	18 28 58.6	77.13	0 46.8
25	15 3 47.31	14.505	18 59 21.7	74.80	0 48.7
26	15 9 35.21	+14.486	−19 28 48.3	− 72.41	0 50.5
27	15 15 22.59	14.462	19 57 16.7	69.95	0 52.4
28	15 21 9.34	14.432	20 24 45.5	67.43	0 54.2
29	15 26 55.29	14.395	20 51 13.0	64.86	0 56.0
30	15 32 40.25	14.349	21 16 37.6	62.19	0 57.8
31	15 38 23.95	+14.291	−21 40 57.6	− 59.46	0 59.6
32	15 44 6.13	+14.221	−22 4 11.3	− 56.66	1 1.4

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	2″.4	2″.4	2″.4	2″.4	2″.5	2″.6
Hor. Parallax . .	6.2	6.2	6.3	6.4	6.6	6.9

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	15 44 6.13	+14.221	−22 4 11.3	−56.66	1 1.4
2	15 49 46.43	14.136	22 26 16.8	53.78	1 3.1
3	15 55 24.47	14.032	22 47 12.3	50.83	1 4.8
4	16 0 59.77	13.907	23 6 55.8	47.79	1 6.5
5	16 6 31.80	13.758	23 25 25.3	44.66	1 8.1
6	16 11 59.94	+13.582	−23 42 38.8	−41.45	1 9.6
7	16 17 23.45	13.373	23 58 34.2	38.16	1 11.0
8	16 22 41.54	13.128	24 13 9.4	34.77	1 12.4
9	16 27 53.27	12.842	24 26 22.2	31.28	1 13.6
10	16 32 57.56	12.508	24 38 10.2	27.70	1 14.7
11	16 37 53.21	+12.120	−24 48 31.2	−24.02	1 15.7
12	16 42 38.82	11.671	24 57 22.6	20.94	1 16.5
13	16 47 12.85	11.153	25 4 41.9	16.35	1 17.2
14	16 51 33.53	10.557	25 10 26.5	12.35	1 17.6
15	16 55 38.87	9.873	25 14 33.7	8.23	1 17.7
16	16 59 26.67	+ 9.092	−25 17 0.5	− 3.98	1 17.5
17	17 2 54.47	8.204	25 17 43.7	+ 0.41	1 17.0
18	17 5 59.54	7.198	25 16 39.8	4.94	1 16.1
19	17 8 38.96	6.064	25 13 45.2	9.64	1 14.8
20	17 10 49.54	4.795	25 8 55.8	14.51	1 13.0
21	17 12 28.00	+ 3.385	−25 2 7.0	+19.59	1 10.7
22	17 13 30.92	1.834	24 53 13.9	24.88	1 7.8
23	17 13 54.97	+ 0.148	24 42 11.2	30.39	1 4.2
24	17 13 37.09	− 1.657	24 28 53.3	36.13	1 0.0
25	17 12 34.73	3.553	24 13 15.4	42.06	0 55.0
26	17 10 46.18	− 5.500	−23 55 13.2	+48.13	0 49.2
27	17 8 10.95	7.432	23 34 45.1	54.21	0 42.7
28	17 4 50.13	9.282	23 11 52.8	60.10	0 35.4
29	17 0 46.80	10.958	22 46 44.0	65.54	0 27.4
30	16 56 6.25	12.368	22 19 33.4	70.17	0 18.9
31	16 50 55.93	−13.423	−21 50 45.3	+73.61	0 9.8
32	16 45 25.33	−14.049	−21 20 53.1	+75.45	{ 0 0.4 23 50.9

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . .	″ 2.7	″ 2.9	″ 3.2	″ 3.6	″ 4.0	″ 4.6
Hor. Parallax . .	7.3	7.8	8.5	9.5	10.7	12.1

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	16 50 55.93	−13.423	−21 50 45.3	+73.61	0 9.8
2	16 45 25.33	14.049	21 20 53.1	75.45	0 0.4 23 50.9
3	16 39 45.31	14.202	20 50 39.9	75.32	23 41.4
4	16 34 7.44	13.873	20 20 54.8	73.06	23 32.0
5	16 28 43.02	13.088	19 52 29.7	68.67	23 23.1
6	16 23 42.34	−11.910	−19 26 14.4	+62.29	23 14.8
7	16 19 13.90	10.417	19 2 52.5	54.28	23 7.1
8	16 15 24.09	8.706	18 42 58.0	45.10	22 0.0
9	16 12 17.05	6.866	18 26 53.0	35.24	22 53.7
10	16 9 54.95	4.975	18 14 48.5	25.14	22 48.1
11	16 8 18.13	− 3.101	−18 6 44.7	+15.24	22 43.2
12	16 7 25.59	− 1.292	18 2 33.1	+ 5.84	22 39.1
13	16 7 15.32	+ 0.417	18 1 58.9	− 2.85	22 35.6
14	16 7 44.68	2.008	18 4 43.0	10.67	22 32.7
15	16 8 50.69	3.471	18 10 23.6	17.56	22 30.4
16	16 10 30.24	+ 4.803	−18 18 38.5	−23.52	22 28.6
17	16 12 40.21	6.007	18 29 5.2	28.56	22 27.3
18	16 15 17.65	7.093	18 41 22.3	32.73	22 26.4
19	16 18 19.80	8.068	18 55 9.8	36.09	22 25.8
20	16 21 44.09	8.941	19 10 8.8	38.71	22 25.6
21	16 25 28.22	+ 9.722	−19 26 2.4	−40.66	22 25.7
22	16 29 30.12	10.423	19 42 35.7	42.02	22 26.0
23	16 33 47.95	11.052	19 59 35.1	42.84	22 26.5
24	16 38 20.07	11.615	20 16 48.3	43.19	22 27.3
25	16 43 5.02	12.122	20 34 4.9	43.12	22 28.3
26	16 48 1.52	+12.579	−20 51 15.1	−42.68	22 29.5
27	16 53 8.45	12.992	21 8 10.8	41.91	22 30.8
28	16 58 24.81	13.366	21 24 44.5	40.85	22 32.3
29	17 3 49.75	13.706	21 40 49.5	39.53	22 33.9
30	17 9 22.48	14.016	21 56 20.2	37.98	22 35.6
31	17 15 2.33	+14.300	−22 11 11.2	−36.24	22 37.4
32	17 20 48.68	+14.559	−22 25 18.1	−34.31	22 39.4

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
Semidiameter . .	″ 4.9	″ 4.7	″ 4.2	″ 3.7	″ 3.3	″ 3.0	″ 2.8
Hor. Parallax . .	13.0	12.5	11.2	9.8	8.7	7.9	7.4

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	21 52 58.55	+7.003	−13 12 33.3	+57.97	3 8.6	1	22 29 47.58	−2.210	−3 20 40.1	+23.98	1 43.0
2	21 55 44.34	6.812	12 49 21.9	57.99	3 7.4	2	22 28 49.98	2.587	3 11 35.3	21.40	1 38.1
3	21 58 25.46	6.615	12 26 10.7	57.95	3 6.1	3	22 27 43.38	2.960	3 3 33.6	18.73	1 33.1
4	22 1 1.78	6.412	12 3 1.1	57.85	3 4.7	4	22 26 27.93	3.325	2 56 37.0	15.97	1 27.9
5	22 3 33.17	6.203	11 39 54.4	57.70	3 3.3	5	22 25 3.84	3.679	2 50 47.5	13.14	1 22.6
6	22 5 59.48	+5.988	−11 16 52.1	+57.49	3 1.8	6	22 23 31.42	−4.020	−2 46 6.6	+10.25	1 17.1
7	22 8 20.56	5.767	10 53 55.6	57.21	3 0.2	7	22 21 51.00	4.345	2 42 35.7	7.31	1 11.5
8	22 10 36.24	5.539	10 31 6.4	56.87	2 58.5	8	22 20 3.00	4.651	2 40 15.9	4.34	1 5.7
9	22 12 46.36	5.304	10 8 26.2	56.47	2 56.8	9	22 18 7.90	4.936	2 39 7.8	+ 1.35	0 59.8
10	22 14 50.75	5.061	9 45 56.4	56.00	2 54.9	10	22 16 6.27	5.196	2 39 11.3	− 1.63	0 53.9
11	22 16 49.21	+4.811	− 9 23 38.8	+55.46	2 53.0	11	22 13 58.75	−5.427	−2 40 26.2	− 4.59	0 47.9
12	22 18 41.56	4.559	9 1 35.0	54.85	2 50.9	12	22 11 46.05	5.636	2 42 51.8	7.51	0 41.7
13	22 20 27.60	4.285	8 39 46.8	54.16	2 48.8	13	22 9 28.96	5.792	2 46 26.7	10.37	0 35.5
14	22 22 7.14	4.010	8 18 16.1	53.40	2 46.5	14	22 7 8.31	5.923	2 51 9.1	13.14	0 29.3
15	22 23 39.99	3.726	7 57 4.6	52.56	2 44.1	15	22 4 44.96	6.016	2 56 56.5	15.79	0 23.0
16	22 25 5.94	+3.434	− 7 36 14.2	+51.63	2 41.6	16	22 2 19.84	−6.069	−3 3 45.9	−18.31	0 16.7
17	22 26 24.78	3.133	7 15 47.0	50.62	2 38.9	17	21 59 53.93	6.061	3 11 33.9	20.67	0 10.4
18	22 27 36.30	2.824	6 55 45.2	49.52	2 36.1	18	21 57 28.22	6.032	3 20 16.6	22.86	0 4.0 23 57.7
19	22 28 40.30	2.506	6 36 10.9	48.34	2 33.2	19	21 55 3.68	5.964	3 29 49.7	24.86	23 51.4
20	22 29 36.56	2.180	6 17 6.0	47.06	2 30.2	20	21 52 41.27	5.876	3 40 8.5	26.66	23 45.2
21	22 30 24.90	+1.846	− 5 58 32.6	+45.69	2 27.0	21	21 50 21.94	−5.730	−3 51 7.8	−28.25	23 39.0
22	22 31 5.12	1.504	5 40 33.2	44.23	2 23.7	22	21 48 6.60	5.545	4 2 42.7	29.62	23 32.9
23	22 31 37.04	1.153	5 23 10.2	42.67	2 20.3	23	21 45 56.11	5.324	4 14 48.0	30.77	23 26.9
24	22 32 0.49	0.799	5 6 25.8	41.01	2 16.7	24	21 43 51.30	5.071	4 27 18.1	31.69	23 21.0
25	22 32 15.31	0.436	4 50 22.5	39.25	2 13.0	25	21 41 52.90	4.790	4 40 7.6	32.39	23 15.2
26	22 32 21.35	+0.067	− 4 35 2.8	+37.38	2 9.2	26	21 40 1.58	−4.483	−4 53 11.3	−32.86	23 9.5
27	22 32 18.48	−0.307	4 20 29.1	35.41	2 5.2	27	21 38 17.92	4.152	5 6 24.2	33.16	23 4.0
28	22 32 6.58	0.685	4 6 44.0	33.33	2 1.1	28	21 36 42.46	3.801	5 19 41.3	33.23	22 58.6
29	22 31 45.58	1.066	3 53 50.0	31.15	1 56.8	29	21 35 15.63	3.434	5 32 57.9	33.12	22 53.4
30	22 31 15.41	1.448	3 41 49.7	28.86	1 52.3	30	21 33 57.77	3.053	5 46 9.7	32.83	22 48.3
31	22 30 36.08	−1.830	− 3 30 45.6	+26.47	1 47.7	31	21 32 49.18	−2.661	−5 59 12.5	−32.36	22 43.4
32	22 29 47.58	−2.210	− 3 20 40.1	+23.98	1 43.0	32	21 31 50.10	−2.261	−6 12 2.5	−31.77	22 38.6

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	17.1″	18.4″	19.9″	21.5″	23.3″	25.1″	27.1″
Hor. Parallax . .	17.7	19.1	20.5	22.2	24.1	26.0	28.0

Day of the Month.	5th.	10th.	15th.	20th.	25th.
Semidiameter.	28.8″	30.2″	31.1″	31.0″	30.2″
Horizontal Parallax . .	29.9	31.3	32.2	32.1	31.3

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

	MARCH.						APRIL.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	21 35 15.63	−3.434	−5 32 57.9	−33.12	22 53.4	1	22 2 36.00	+6.564	−8 34 6.7	+ 9.84	21 22.3
2	21 33 57.77	3.053	5 46 9.7	32.83	22 48.3	2	22 5 15.65	6.738	8 29 51.7	11.41	21 21.1
3	21 32 49.18	2.661	5 59 12.5	32.38	22 43.4	3	22 7 59.37	6.903	8 24 59.4	12.96	21 20.0
4	21 31 50.10	2.261	6 12 2.5	31.77	22 38.6	4	22 10 46.96	7.061	8 19 30.2	14.48	21 18.9
5	21 31 0.66	1.857	6 24 36.1	31.02	22 34.0	5	22 13 38.25	7.211	8 13 24.6	15.98	21 17.9
6	21 30 20.96	−1.451	−6 36 50.1	−30.14	22 29.6	6	22 16 33.05	+7.353	−8 6 43.3	+17.46	21 16.9
7	21 29 51.03	1.044	6 48 41.6	29.14	22 25.3	7	22 19 31.18	7.489	7 59 26.7	18.92	21 16.0
8	21 29 30.85	0.638	7 0 8.0	28.04	22 21.2	8	22 22 32.48	7.618	7 51 35.4	20.35	21 15.1
9	21 29 20.37	−0.236	7 11 7.0	26.85	22 17.3	9	22 25 36.79	7.740	7 43 10.0	21.76	21 14.3
10	21 29 19.52	+0.163	7 21 36.2	25.57	22 13.5	10	22 28 43.98	7.857	7 34 11.0	23.15	21 13.5
11	21 29 28.17	+0.557	−7 31 33.9	−24.22	22 9.9	11	22 31 53.89	+7.968	−7 24 39.0	+24.51	21 12.8
12	21 29 46.17	0.943	7 40 58.5	22.81	22 6.4	12	22 35 6.40	8.074	7 14 34.5	25.85	21 12.1
13	21 30 13.34	1.321	7 49 48.5	21.35	22 3.0	13	22 38 21.40	8.175	7 3 58.2	27.16	21 11.4
14	21 30 49.48	1.690	7 58 2.6	19.83	21 59.8	14	22 41 38.76	8.271	6 52 50.6	28.45	21 10.8
15	21 31 34.37	2.050	8 5 39.9	18.27	21 56.7	15	22 44 58.38	8.362	6 41 12.6	29.72	21 10.2
16	21 32 27.79	+2.400	−8 12 39.5	−16.68	21 53.8	16	22 48 20.15	+8.450	−6 29 4.4	+30.96	21 9.6
17	21 33 29.49	2.740	8 19 0.5	15.06	21 51.0	17	22 51 43.97	8.534	6 16 26.8	32.17	21 9.1
18	21 34 39.25	3.070	8 24 42.0	13.41	21 48.3	18	22 55 9.76	8.614	6 3 20.5	33.36	21 8.6
19	21 35 56.80	3.390	8 29 43.8	11.74	21 45.8	19	22 58 37.42	8.690	5 49 45.9	34.52	21 8.2
20	21 37 21.89	3.698	8 34 5.6	10.06	21 43.4	20	23 2 6.88	8.763	5 35 43.7	35.65	21 7.8
21	21 38 54.25	+3.996	−8 37 47.0	− 8.38	21 41.1	21	23 5 38.04	+8.833	−5 21 14.9	+36.75	21 7.4
22	21 40 33.64	4.283	8 40 47.9	6.69	21 39.0	22	23 9 10.83	8.899	5 6 19.9	37.82	21 7.0
23	21 42 19.78	4.559	8 43 8.3	5.01	21 36.9	23	23 12 45.17	8.962	4 50 59.3	38.87	21 6.6
24	21 44 12.41	4.824	8 44 48.0	3.32	21 34.9	24	23 16 20.99	9.022	4 35 14.0	39.89	21 6.3
25	21 46 11.25	5.078	8 45 47.1	− 1.63	21 33.0	25	23 19 58.23	9.080	4 19 4.6	40.88	21 6.0
26	21 48 16.06	+5.321	−8 46 5.8	+ 0.05	21 31.2	26	23 23 36.83	+9.135	−4 2 31.9	+41.84	21 5.7
27	21 50 26.57	5.553	8 45 44.4	1.72	21 29.5	27	23 27 16.72	9.188	3 45 36.5	42.77	21 5.4
28	21 52 42.52	5.774	8 44 43.2	3.38	21 27.9	28	23 30 57.85	9.238	3 28 19.2	43.66	21 5.2
29	21 55 3.67	5.986	8 43 2.5	5.02	21 26.4	29	23 34 40.15	9.286	3 10 40.8	44.52	21 5.0
30	21 57 29.79	6.188	8 40 42.5	6.64	21 25.0	30	23 38 23.59	9.332	2 52 41.9	45.36	21 4.8
31	22 0 0.64	+6.381	−8 37 43.8	+ 8.25	21 23.6	31	23 42 8.10	+9.376	−2 34 23.3	+46.17	21 4.6
32	22 2 36.00	+6.564	−8 34 6.7	+ 9.84	21 22.3	32	23 45 53.65	+9.419	−2 15 45.8	+46.95	21 4.5

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter . . .	28.8	27.0	25.1	23.1	21.3	19.6
Horizontal Parallax	29.8	28.0	25.9	23.9	22.0	20.3

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
	″	″	″	″	″	″
Semidiameter . .	18.2	16.8	15.6	14.6	13.7	12.9
Hor. Parallax . .	18.8	17.4	16.2	15.1	14.2	13.3

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	23 42 8.10	+ 9.376	−2 34 23.3	+46.17	21 4.6
2	23 45 53.65	9.419	2 15 45.8	46.95	21 4.5
3	23 49 40.20	9.460	1 56 50.1	47.70	21 4.3
4	23 53 27.72	9.499	1 37 36.8	48.41	21 4.2
5	23 57 16.17	9.537	1 18 6.8	49.09	21 4.1
6	0 1 5.53	+ 9.575	−0 58 20.8	+49.74	21 4.0
7	0 4 55.78	9.612	0 38 19.4	50.36	21 3.9
8	0 8 46.90	9.648	−0 18 3.5	50.96	21 3.8
9	0 12 38.86	9.683	+0 2 26.3	51.53	21 3.8
10	0 16 31.66	9.717	0 23 9.3	52.06	21 3.7
11	0 20 25.29	+ 9.751	+0 44 4.8	+52.56	21 3.7
12	0 24 19.73	9.785	1 5 12.2	53.04	21 3.6
13	0 28 14.99	9.819	1 26 30.6	53.49	21 3.6
14	0 32 11.06	9.853	1 47 59.5	53.91	21 3.6
15	0 36 7.94	9.887	2 9 38.1	54.30	21 3.6
16	0 40 5.64	+ 9.921	+2 31 25.7	+54.66	21 3.6
17	0 44 4.15	9.955	2 53 21.7	54.99	21 3.7
18	0 48 3.49	9.990	3 15 25.2	55.29	21 3.7
19	0 52 3.65	10.024	3 37 35.7	55.57	21 3.8
20	0 56 4.64	10.058	3 59 52.3	55.82	21 3.9
21	1 0 6.46	+10.093	+4 22 14.5	+56.04	21 4.0
22	1 4 9.12	10.128	4 44 41.5	56.22	21 4.1
23	1 8 12.63	10.164	5 7 12.6	56.37	21 4.2
24	1 12 16.99	10.200	5 29 47.0	56.49	21 4.4
25	1 16 22.21	10.236	5 52 24.2	56.58	21 4.5
26	1 20 28.30	+10.272	+6 15 3.2	+56.65	21 4.7
27	1 24 35.26	10.308	6 37 43.3	56.69	21 4.9
28	1 28 43.10	10.345	7 0 23.9	56.69	21 5.1
29	1 32 51.83	10.382	7 23 4.1	56.66	21 5.3
30	1 37 1.46	10.420	7 45 43.3	56.60	21 5.5
31	1 41 11.99	+10.458	+8 8 20.8	+56.51	21 5.7
32	1 45 23.44	+10.496	+8 30 55.7	+56.39	21 6.0

JUNE.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	1 45 23.44	+10.496	+ 8 30 55.7	+56.39	21 6.0
2	1 49 35.82	10.535	8 53 27.4	56.24	21 6.3
3	1 53 49.14	10.575	9 15 55.1	56.06	21 6.6
4	1 58 3.40	10.615	9 38 18.1	55.85	21 6.9
5	2 2 18.62	10.655	10 0 35.7	55.61	21 7.3
6	2 6 34.82	+10.696	+10 22 47.1	+55.33	21 7.6
7	2 10 52.01	10.737	10 44 51.6	55.03	21 8.0
8	2 15 10.21	10.780	11 6 48.5	54.70	21 8.4
9	2 19 29.44	10.823	11 28 37.1	54.34	21 8.8
10	2 23 49.71	10.867	11 50 16.8	53.96	21 9.2
11	2 28 11.04	+10.911	+12 11 46.8	+53.54	21 9.6
12	2 32 33.45	10.956	12 33 6.3	53.09	21 10.0
13	2 36 56.95	11.002	12 54 14.7	52.61	21 10.5
14	2 41 21.57	11.049	13 15 11.2	52.10	21 11.0
15	2 45 47.31	11.096	13 35 55.2	51.56	21 11.5
16	2 50 14.19	+11.144	+13 56 25.9	+50.99	21 12.0
17	2 54 42.23	11.193	14 16 42.6	50.40	21 12.6
18	2 59 11.44	11.242	14 36 44.7	49.78	21 13.1
19	3 3 41.83	11.291	14 56 31.4	49.12	21 13.7
20	3 8 13.41	11.441	15 16 2.0	48.43	21 14.3
21	3 12 46.19	+11.391	+15 35 15.8	+47.71	21 14.9
22	3 17 20.18	11.441	15 54 12.0	46.96	21 15.5
23	3 21 55.38	11.492	16 12 50.0	46.18	21 16.2
24	3 26 31.79	11.542	16 31 9.0	45.38	21 16.9
25	3 31 9.41	11.593	16 49 8.3	44.55	21 17.6
26	3 35 48.25	+11.643	+17 6 47.2	+43.69	21 18.3
27	3 40 28.30	11.694	17 24 5.1	42.80	21 19.1
28	3 45 9.55	11.745	17 41 1.2	41.87	21 19.8
29	3 49 52.01	11.794	17 57 34.8	40.92	21 20.6
30	3 54 35.67	11.844	18 13 45.2	39.94	21 21.4
31	3 59 20.51	+11.893	+18 29 31.7	+38.93	21 22.2
32	4 4 6.53	+11.942	+18 44 53.6	+37.89	21 23.0

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	12.1″	11.5″	10.9″	10.4″	9.9″	9.5″	9.1″
Hor. Parallax . .	12.6	11.9	11.3	10.7	10.3	9.8	9.4

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	8.7″	8.4″	8.1″	7.8″	7.6″	7.4″
Hor. Parallax . .	9.0	8.7	8.4	8.1	7.9	7.6

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	3 59 20.51	+11.893	+18 29 31.7	+38.93	21 22.2
2	4 4 6.53	11.942	18 44 53.6	37.89	21 23.0
3	4 8 53.71	11.990	18 59 50.3	36.83	21 23.9
4	4 13 42.04	12.038	19 14 21.2	35.74	21 24.8
5	4 18 31.51	12.085	19 28 25.6	34.62	21 25.7
6	4 23 22.12	+12.132	+19 42 2.8	+33.48	21 26.6
7	4 28 13.84	12.178	19 55 12.2	32.31	21 27.6
8	4 33 6.66	12.223	20 7 53.3	31.11	21 28.5
9	4 38 0.55	12.268	20 20 5.4	29.89	21 29.5
10	4 42 55.50	12.312	20 31 47.9	28.65	21 30.5
11	4 47 51.49	+12.355	+20 43 0.2	+27.38	21 31.5
12	4 52 48.50	12 397	20 53 41.9	26.09	21 32.5
13	4 57 46.51	12.438	21 3 52.3	24.78	21 33.6
14	5 2 45.49	12.478	21 13 31.0	23.45	21 34.6
15	5 7 45.41	12.517	21 22 37.4	22.10	21 35.7
16	5 12 46.25	+12.554	+21 31 11.1	+20.72	21 36.8
17	5 17 47.97	12.590	21 39 11.5	19.32	21 37.9
18	5 22 50.54	12.625	21 46 38.2	17.90	21 39.0
19	5 27 53.93	12.658	21 53 30.8	16.47	21 40.1
20	5 32 58.10	12.690	21 59 48.8	15.02	21 41.2
21	5 38 3.01	+12.720	+22 5 31.9	+13.56	21 42.4
22	5 43 8.62	12.749	22 10 39.6	12.08	21 43.5
23	5 48 14.89	12.775	22 15 11.6	10.59	21 44.7
24	5 53 21.77	12.799	22 19 7.6	9.08	21 45.9
25	5 58 29.22	12.822	22 22 27.3	7.56	21 47.1
26	6 3 37.18	+12.843	+22 25 10.3	+ 6.02	21 48.3
27	6 8 45.61	12.861	22 27 16.5	4.48	21 49.5
28	6 13 54:45	12.877	22 28 45.5	2.93	21 50.7
29	6 19 3.66	12.891	22 29 37.2	+ 1.37	21 51.9
30	6 24 13.18	12.903	22 29 51.4	− 0.19	21 53.1
31	6 29 22.97	+12.912	+22 29 28.0	− 1.76	21 54.4
32	6 34 32.96	+12.919	+22 28 26.7	− 3.34	21 55.6

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
Semidiameter . .	7.2	7.0	6.8	6.6	6.5	6.3
Hor. Parallax . .	7.4	7.2	7.0	6.8	6.7	6.5

AUGUST.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	6 34 32.96	+12.919	+22 28 26.7	− 3.34	21 55.6
2	6 39 43.11	12.925	22 26 47.6	4.92	21 56.8
3	6 44 53.37	12.929	22 24 30.5	6.51	21 58.0
4	6 50 3.69	12.931	22 21 35.4	8.09	21 59.3
5	6 55 14.01	12.930	22 18 2.3	9.68	22 0.5
6	7 0 24.30	+12.927	+22 13 51.2	−11.26	22 1.7
7	7 5 34.50	12.922	22 9 2.0	12.84	22 2.9
8	7 10 44.56	12.915	22 3 34.9	14.42	22 4.2
9	7 15 54.44	12.906	21 57 30.0	15.99	22 5.4
10	7 21 4.09	12.896	21 50 47.4	17.56	22 6.6
11	7 26 13.46	+12.884	+21 43 27.2	−19.12	22 7.8
12	7 31 22.51	12.870	21 35 29.6	20.68	22 9.1
13	7 36 31.21	12.855	21 26 54.8	22.22	22 10.3
14	7 41 39.52	12.838	21 17 43.0	23.76	22 11.5
15	7 46 47.41	12.819	21 7 54.4	25.29	22 12.7
16	7 51 54.83	+12.799	+20 57 29.4	−26.80	22 13.8
17	7 57 1.75	12.777	20 46 28.2	28.30	22 15.0
18	8 2 8.14	12.754	20 34 51.0	29.79	22 16.1
19	8 7 13.95	12.730	20 22 38.2	31.27	22 17.3
20	8 12 19.16	12.704	20 9 50.2	32.73	22 18.4
21	8 17 23.74	+12.677	+19 56 27.4	−34.17	22 19.5
22	8 22 27.66	12.649	19 42 30.3	35.59	22 20.6
23	8 27 30.88	12.619	19 27 59.1	37.00	22 21.7
24	8 32 33.39	12.589	19 12 54.4	38.39	22 22.8
25	8 37 35.16	12.558	18 57 16.6	39.76	22 23.9
26	8 42 36.17	+12.526	+18 41 6.1	−41.11	22 24.9
27	8 47 36.39	12.493	18 24 23.5	42 44	22 26.0
28	8 52 35.81	12.459	18 7 9.4	43.75	22 27.0
29	8 57 34.41	12.424	17 49 24.1	45.03	22 28.0
30	9 2 32.18	12.389	17 31 8.3	46.29	22 29.0
31	9 7 29.10	+12.354	+17 12 22.5	−47.53	22 30.0
32	9 12 25.16	+12.318	+16 53 7.2	−48.74	22 31.0

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
	″	″	″	″	″	″
Semidiameter . .	6.2	6.1	6.0	5.9	5.8	5.7
Hor. Parallax . .	6.4	6.3	6.2	6.1	6.0	5.9

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	9 12 25.16	+12.318	+16 53 7.2	−48.74	22 31.0
2	9 17 20.35	12.282	16 33 23.2	49.93	22 32.0
3	9 22 14.67	12.245	16 13 11.0	51.09	22 32.9
4	9 27 8.11	12.208	15 52 31.2	52.23	22 33.9
5	9 32 0.69	12.172	15 31 24.4	53.34	22 34.8
6	9 36 52.39	+12.136	+15 9 51.1	−54.43	22 35.7
7	9 41 43.23	12.100	14 47 52.0	55.49	22 36.6
8	9 46 33.21	12.065	14 25 27.8	56.52	22 37.5
9	9 51 22.35	12.030	14 2 39.1	57.53	22 38.3
10	9 56 10.65	11.995	13 39 26.6	58.51	22 39.2
11	10 0 58.13	+11.961	+13 15 50.9	−59.46	22 40.0
12	10 5 44.79	11.928	12 51 52.6	60.39	22 40.9
13	10 10 30.65	11.895	12 27 32.4	61.29	22 41.7
14	10 15 15.74	11.863	12 2 50.9	62.16	22 42.5
15	10 20 0.08	11.832	11 37 48.9	63.00	22 43.3
16	10 24 43.69	+11.802	+11 12 27.1	−63.81	22 44.1
17	10 29 26.59	11.773	10 46 46.0	64.59	22 44.8
18	10 34 8.80	11.745	10 20 46.4	65.35	22 45.6
19	10 38 50.35	11.718	9 54 29.0	66.08	22 46.3
20	10 43 31.25	11.691	9 27 54.5	66.78	22 47.0
21	10 48 11.53	+11.666	+ 9 1 3.6	−67.45	22 47.7
22	10 52 51.23	11.642	8 33 57.0	68.09	22 48.4
23	10 57 30.36	11.619	8 6 35.3	68.70	22 49.1
24	11 2 8.96	11.597	7 38 59.3	69.28	22 49.8
25	11 6 47.05	11.577	7 11 9.8	69.84	22 50.5
26	11 11 24.66	+11.558	+ 6 43 7.4	−70.36	22 51.2
27	11 16 1.83	11.540	6 14 53.0	70.85	22 51.9
28	11 20 38.57	11.523	5 46 27.1	71.31	22 52.6
29	11 25 14.92	11.507	5 17 50.5	71.74	22 53.2
30	11 29 50.92	11.493	4 49 4.0	72.14	22 53.9
31	11 34 26.59	+11.480	+ 4 20 8.3	−72.50	22 54.5
32	11 39 1.98	+11.469	+ 3 51 4.1	−72.84	22 55.2

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″
Semidiameter . .	5.6	5.5	5.5	5.4	5.3	5.3
Hor. Parallax . .	5.8	5.7	5.6	5.6	5.5	5.5

OCTOBER

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	11 34 26.59	+11.480	+ 4 20 8.3	−72.50	22 54.5
2	11 39 1.98	11.469	3 51 4.1	72.84	22 55.2
3	11 43 37.11	11.459	3 21 52.2	73.15	22 55.8
4	11 48 12.03	11.451	2 52 33.4	73.42	22 56.5
5	11 52 46.77	11.444	2 23 8.2	73.67	22 57.1
6	11 57 21.37	+11.439	+ 1 53 37.4	−73.89	22 57.7
7	12 1 55.87	11.436	1 24 1.8	74.07	22 58.3
8	12 6 30.30	11.434	0 54 22.2	74.22	22 59.0
9	12 11 4.71	11.434	+ 0 24 39.2	74.35	22 59.6
10	12 15 39.14	11.436	− 0 5 6.4	74.45	23 0.2
11	12 20 13.63	+11.439	− 0 34 54.0	−74.52	23 0.8
12	12 24 48.22	11.444	1 4 42.8	74.55	23 1.4
13	12 29 22.96	11.451	1 34 32.0	74.55	23 2.1
14	12 33 57.88	11.460	2 4 20.9	74.52	23 2.7
15	12 38 33.04	11.470	2 34 8.8	74.46	23 3.4
16	12 43 8.46	+11.482	− 3 3 54.9	−74.37	23 4.0
17	12 47 44.19	11.496	3 33 38.5	74.25	23 4.7
18	12 52 20.28	11.512	4 3 18.8	74.10	23 5.4
19	12 56 56.76	11.529	4 32 55.0	73.92	23 6.1
20	13 1 33.67	11.548	5 2 26.5	73.70	23 6.8
21	13 6 11.05	+11.568	− 5 31 52.5	−73.45	23 7.4
22	13 10 48.94	11.590	6 1 12.1	73.17	23 8.1
23	13 15 27.38	11.614	6 30 24.7	72.86	23 8.8
24	13 20 6.40	11.639	6 59 29.3	72.52	23 9.5
25	13 24 46.04	11.665	7 28 25.3	72.14	23 10.3
26	13 29 26.34	+11.693	− 7 57 11.8	−71.73	23 11.0
27	13 34 7.33	11.723	8 25 48.1	71.29	23 11.8
28	13 38 49.05	11.754	8 54 13.4	70.82	23 12.5
29	13 43 31.53	11.786	9 22 26 9	70.31	23 13.3
30	13 48 14.80	11.820	9 50 27.8	69.77	23 14.1
31	13 52 58.89	+11.855	−10 18 15.3	−69.19	23 14.9
32	13 57 43.84	+11.891	−10 45 46.5	−68.58	23 15.7

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″
Semidiameter . .	5.2	5.2	5.2	5.1	5.1	5.1
Hor. Parallax . .	5.4	5.4	5.3	5.3	5.3	5.3

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	13 57 43.84	+11.891	−10 45 48.5	−68.58	23 15.7
2	14 2 29.67	11.929	11 13 6.6	67.94	23 16.6
3	14 7 16.42	11.968	11 40 8.9	67.26	23 17.4
4	14 12 4.12	12.008	12 6 54.6	66.55	23 18.3
5	14 16 52.80	12.049	12 33 22.8	65.81	23 19.2
6	14 21 42.48	+12.091	−12 59 32.8	−65.03	23 20.1
7	14 26 33.18	12.135	13 25 23.8	64.22	23 21.0
8	14 31 24.94	12.179	13 50 54.9	63.37	23 21.9
9	14 36 17.78	12.225	14 16 5.4	62.49	23 22.9
10	14 41 11.73	12.271	14 40 54.4	61.58	23 23.9
11	14 46 6.81	+12.319	−15 5 21.2	−60.64	23 24.9
12	14 51 3.04	12.367	15 29 24.9	59.66	23 25.9
13	14 56 0.44	12.416	15 53 4.8	58.65	23 26.9
14	15 0 59.04	12.466	16 16 20.1	57.61	23 28.0
15	15 5 58.83	12.516	16 39 9.9	56.54	23 29.1
16	15 10 59.83	+12.567	−17 1 33.5	−55.43	23 30.2
17	15 16 2.05	12.618	17 23 30.1	54.29	23 31.3
18	15 21 5.50	12.669	17 44 58.9	53.11	23 32.4
19	15 26 10.18	12.720	18 5 59.1	51.90	23 33.5
20	15 31 16.10	12.772	18 26 29.9	50.66	23 34.7
21	15 36 23.25	+12.823	−18 46 30.6	−49.39	23 35.9
22	15 41 31.64	12.874	19 6 0.4	48.09	23 37.1
23	15 46 41.25	12.925	19 24 58.7	46.75	23 38.3
24	15 51 52.04	12.975	19 43 24.6	45.39	23 39.6
25	15 57 4.03	13.025	20 1 17.4	44.00	23 40.9
26	16 2 17.22	+13.074	−20 18 36.3	−42.57	23 42.2
27	16 7 31.57	13.122	20 35 20.5	41.11	23 43.5
28	16 12 47.06	13.169	20 51 29.4	39.63	23 44.9
29	16 18 3.67	13.215	21 7 2.4	38.12	23 46.2
30	16 23 21.36	13.260	21 21 58.9	36.58	23 47.6
31	16 28 40.12	+13.303	−21 36 18.2	−35.01	23 49.0
32	16 33 59.90	+13.345	−21 49 59.5	−33.42	23 50.4

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	16 28 40.12	+13.303	−21 36 18.2	−35.01	23 49.0
2	16 33 59.90	13.345	21 49 59.5	33.42	23 50.4
3	16 39 20.68	13.386	22 3 2.3	31.81	23 51.8
4	16 44 42.41	13.425	22 15 26.0	30.17	23 53.3
5	16 50 5.07	13.462	22 27 10.1	28.51	23 54.7
6	16 55 28.61	+13.498	−22 38 14.1	−26.83	23 56.2
7	17 0 52.99	13.532	22 48 37.3	25.12	23 57.6
8	17 6 18.16	13.564	22 58 19.4	23.39	23 59.1
9	17 11 44.07	13.594	23 7 19.8	21.64	
10	17 17 10.67	13.622	23 15 38.2	19.88	0 0.6
11	17 22 37.92	+13.648	−23 23 14.1	−18.11	0 2.1
12	17 28 5.77	13.672	23 30 7.3	16.32	0 3.6
13	17 33 34.16	13.694	23 36 17.3	14.52	0 5.2
14	17 39 3.04	13.713	23 41 43.9	12.70	0 6.7
15	17 44 32.36	13.730	23 46 26.8	10.87	0 8.3
16	17 50 2.04	+13.744	−23 50 25.8	− 9.03	0 9.8
17	17 55 32.03	13.755	23 53 40.5	7.19	0 11.4
18	18 1 2.26	13.764	23 56 10.9	5.34	0 12.9
19	18 6 32.67	13.770	23 57 56.8	3.48	0 14.5
20	18 12 3.20	13.774	23 58 58.1	− 1.62	0 16.0
21	18 17 33.78	+13.775	−23 59 14.7	+ 0.24	0 17.6
22	18 23 4.35	13.773	23 58 46.7	2.10	0 19.2
23	18 28 34.83	13.768	23 57 33.9	3.96	0 20.8
24	18 34 5.17	13.760	23 55 36.5	5.82	0 22.3
25	18 39 35.29	13.749	23 52 54.4	7.68	0 23.9
26	18 45 5.13	+13.736	−23 49 27.9	+ 9.53	0 25.5
27	18 50 34.62	13.720	23 45 17.0	11.37	0 27.1
28	18 56 3.69	13.702	23 40 22.0	13.21	0 28.7
29	19 1 32.28	13.681	23 34 42.9	15.04	0 30.2
30	19 7 0.34	13.657	23 28 20.1	16.86	0 31.7
31	19 12 27.79	+13.631	−23 21 13.8	+18.66	0 33.2
32	19 17 54.59	+13.602	−23 13 24.4	+20.45	0 34.7

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . .	5″.0	5″.0	5″.0	5″.0	5″.0	5″.0
Hor. Parallax . .	5.2	5.2	5.2	5.2	5.2	5.2

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
Semidiameter . .	5″.0	5″.0	5″.0	5″.0	5″.0	5″.0	5″.0
Hor. Parallax . .	5.2	5.2	5.2	5.2	5.2	5.2	5.2

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	11 35 1.07	+2.427	+5 52 39.4	−11.35	16 48.7
2	11 35 58.43	2.351	5 48 12.8	10.85	16 45.7
3	11 36 53.94	2.273	5 43 58.6	10.33	16 42.7
4	11 37 47.56	2.194	5 39 57.0	9.80	16 39.6
5	11 38 39.25	2.113	5 36 8.2	9.26	16 36.5
6	11 39 28.99	+2.030	+5 32 32.5	− 8.71	16 33.4
7	11 40 16.72	1.946	5 29 10.2	8.15	16 30.2
8	11 41 2.41	1.860	5 26 1.3	7.58	16 27.0
9	11 41 46.03	1.773	5 23 6.3	7.00	16 23.8
10	11 42 27.53	1.684	5 20 25.2	6.41	16 20.5
11	11 43 6.88	+1.594	+5 17 58.4	− 5.82	16 17.2
12	11 43 44.05	1.502	5 15 46.0	5.21	16 13.9
13	11 44 19.00	1.409	5 13 48.3	4.60	16 10.5
14	11 44 51.68	1.314	5 12 5.4	3.97	16 7.1
15	11 45 22.07	1.218	5 10 37.6	3.34	16 3.6
16	11 45 50.12	+1.120	+5 9 25.2	− 2.70	16 0.1
17	11 46 15.80	1.020	5 8 28.2	2.04	15 56.6
18	11 46 39.07	0.918	5 7 47.0	1.39	15 53.0
19	11 46 59.87	0.815	5 7 21.7	0.72	15 49.4
20	11 47 18.18	0.710	5 7 12.5	− 0.04	15 45.7
21	11 47 33.95	+0.603	+5 7 19.7	+ 0.64	15 42.0
22	11 47 47.13	0.495	5 7 43.4	1.33	15 38.3
23	11 47 57.68	0.385	5 8 23.8	2.04	15 34.5
24	11 48 5.56	0.272	5 9 21.2	2.74	15 30.7
25	11 48 10.73	0.158	5 10 35.5	3.46	15 26.8
26	11 48 13.15	+0.043	+5 12 7.1	+ 4.18	15 22.9
27	11 48 12.78	−0.074	5 13 56.0	4.90	15 18.9
28	11 48 9.57	0.193	5 16 2.3	5.63	15 14.9
29	11 48 3.51	0.313	5 18 26.0	6.36	15 10.8
30	11 47 54.56	0.435	5 21 7.3	7.09	15 6.7
31	11 47 42.67	−0.556	+5 24 6.2	+ 7.83	15 2.6
32	11 47 27.88	−0.679	+5 27 22.6	+ 8.58	14 58.4

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	4″.8	5″.0	5″.2	5″.5	5″.7	6″.0	6″.3
Hor. Parallax . .	8.4	8.8	9.2	9.6	10.0	10.5	11.0

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	11 47 27.88	−0.679	+5 27 22.6	+ 8.55	14 58.4
2	11 47 10.11	0.803	5 30 56.5	9.28	14 54.1
3	11 46 49.35	0.927	5 34 47.9	10.00	14 49.8
4	11 46 25.61	1.051	5 38 56.4	10.71	14 45.4
5	11 45 58.89	1.176	5 43 22.1	11.42	14 41.1
6	11 45 29.19	−1.300	+5 48 4.7	+12.13	14 36.6
7	11 44 56.51	1.424	5 53 3.9	12.81	14 32.1
8	11 44 20.87	1.546	5 58 19.5	13.48	14 27.5
9	11 43 42.29	1.668	6 3 51.0	14.14	14 22.9
10	11 43 0.80	1.790	6 9 38.1	14.78	14 18.3
11	11 42 16.41	−1.909	+6 15 40.6	+15.41	14 13.6
12	11 41 29.17	2.027	6 21 57.9	16.02	14 8.9
13	11 40 39.11	2.143	6 28 29.4	16.60	14 4.1
14	11 39 46.29	2.258	6 35 14.7	17.17	13 59.2
15	11 38 50.74	2.370	6 42 13.3	17.70	13 54.3
16	11 37 52.53	−2.480	+6 49 24.5	+18.22	13 49.4
17	11 36 51.70	2.587	6 56 47.7	18.70	13 44.5
18	11 35 48.33	2.692	7 4 22.2	19.16	13 39.5
19	11 34 42.50	2.793	7 12 7.4	19.59	13 34.4
20	11 33 34.27	2.891	7 20 2.5	19.99	13 29.3
21	11 32 23.72	−2.986	+7 28 6.7	+20.35	13 24.2
22	11 31 10.95	3.076	7 36 19.1	20.68	13 19.1
23	11 29 56.08	3.161	7 44 38.8	20.96	13 13.9
24	11 28 39.21	3.242	7 53 4.8	21.20	13 8.7
25	11 27 20.44	3.319	8 1 36.4	21.42	13 3.4
26	11 25 59.91	−3.390	+8 10 12.7	+21.58	12 58.1
27	11 24 37.72	3.455	8 18 52.3	21.70	12 52.8
28	11 23 14.04	3.515	8 27 34.2	21.78	12 47.5
29	11 21 49.01	3.568	8 36 17.5	21.81	12 42.1
30	11 20 22.79	3.615	8 45 1.0	21.80	12 36.8
31	11 18 55.52	−3.654	+8 53 43.7	+21.74	12 31.4
32	11 17 27.39	−3.687	+9 2 24.4	+21.63	12 26.0

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	6″.5	6″.8	7″.0	7″.2	7″.4	7″.5
Hor. Parallax . .	11.4	11.9	12.3	12.6	12.9	13.1

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	11 21 49.01	−3.568	+ 8 36 17.5	+21.81	12 42.1	1	10 41 23.72	−2.047	+11 50 28.9	+ 5.35	10 0.3
2	11 20 22.79	3.615	8 45 1.0	21.80	12 36.8	2	10 40 36.03	1.927	11 52 27.9	4.56	9 55.6
3	11 18 55.52	3.654	8 53 43.7	21.74	12 31.4	3	10 39 51.23	1.806	11 54 8.1	3.78	9 51.0
4	11 17 27.39	3.687	9 2 24.4	21.63	12 26.0	4	10 39 9.36	1.683	11 55 29.5	3.00	9 46.4
5	11 15 58.55	3.712	9 11 1.8	21.47	12 20.6	5	10 38 30.43	1.560	11 56 32.3	2.23	9 41.8
6	11 14 29.19	−3.730	+ 9 19 34.9	+21.27	12 15.1	6	10 37 54.49	−1.435	+11 57 16.6	+ 1.46	9 37.3
7	11 12 59.48	3.742	9 28 2.6	21.02	12 9.7	7	10 37 21.55	1.310	11 57 42.5	+ 0.70	9 32.9
8	11 11 29.60	3.745	9 36 23.9	20.73	12 4.3	8	10 36 51.63	1.184	11 57 50.2	− 0.06	9 28.5
9	11 9 59.72	3.741	9 44 37.7	20.39	11 58.9	9	10 36 24.72	1.059	11 57 39.9	0.80	9 24.1
10	11 8 30.02	3.730	9 52 42.9	20.02	11 53.4	10	10 36 0.81	0.934	11 57 11.9	1.53	9 19.8
11	11 7 0.68	−3.712	+10 0 38.6	+19.60	11 48.0	11	10 35 39.89	−0.810	+11 56 26.4	− 2.25	9 15.5
12	11 5 31.86	3.686	10 8 23.8	19.15	11 42.6	12	10 35 21.94	0.686	11 55 23.7	2.97	9 11.3
13	11 4 3.75	3.653	10 15 57.6	18.66	11 37.3	13	10 35 6.95	0.563	11 54 4.0	3.67	9 7.1
14	11 2 36.50	3.615	10 23 19.3	18.13	11 31.9	14	10 34 54.90	0.442	11 52 27.7	4.38	9 3.0
15	11 1 10.26	3.569	10 30 28.0	17.58	11 26.5	15	10 34 45.75	0.322	11 50 34.7	5.04	8 58.9
16	10 59 45.18	−3.518	+10 37 23.1	+17.00	11 21.2	16	10 34 39.46	−0.203	+11 48 25.8	− 5.70	8 54.9
17	10 58 21.41	3.460	10 44 3.8	16.39	11 15.9	17	10 34 36.01	−0.085	11 46 1.0	6.36	8 51.0
18	10 56 59.09	3.397	10 50 29.6	15.75	11 10.6	18	10 34 35.37	+0.031	11 43 20.6	7.00	8 47.0
19	10 55 38.37	3.328	10 56 39.9	15.09	11 5.4	19	10 34 37.50	0.145	11 40 24.9	7.63	8 43.1
20	10 54 19.36	3.253	11 2 34.2	14.41	11 0.2	20	10 34 42.35	0.258	11 37 14.2	8.25	8 39.3
21	10 53 2.20	−3.175	+11 8 11.8	+13.72	10 55.0	21	10 34 49.89	+0.369	+11 33 48.8	− 8.86	8 35.5
22	10 51 46.99	3.091	11 13 32.6	13.01	10 49.8	22	10 35 0.09	0.479	11 30 8.9	9.46	8 31.8
23	10 50 33.84	3.003	11 18 36.2	12.28	10 44.6	23	10 35 12.90	0.587	11 26 14.7	10.05	8 28.1
24	10 49 22.86	2.911	11 23 22.1	11.54	10 39.5	24	10 35 28.28	0 694	11 22 6.6	10.63	8 24.4
25	10 48 14.14	2.814	11 27 50.2	10.79	10 34.5	25	10 35 46.20	0.799	11 17 44.6	11.20	8 20.8
26	10 47 7.77	−2.714	+11 32 0.1	+10.03	10 29.5	26	10 36 6.63	+0.902	+11 13 9.0	−11.76	8 17.2
27	10 46 3.87	2.610	11 35 51.6	9.26	10 24.5	27	10 36 29.51	1.004	11 8 20.1	12.31	8 13.7
28	10 45 2.49	2.503	11 39 24.6	8.48	10 19.6	28	10 36 54.82	1.104	11 3 18.2	12.85	8 10.2
29	10 44 3.73	2.393	11 42 38.9	7.70	10 14.7	29	10 37 22.51	1.203	10 58 3.4	13.39	8 6.7
30	10 43 7.64	2.280	11 45 34.4	6.92	10 9.9	30	10 37 52.56	1.301	10 52 35.8	13.91	8 3.3
31	10 42 14.28	−2.165	+11 48 11.1	+ 6.14	10 5.1	31	10 38 24.93	+1.396	+10 46 55.7	−14.42	7 59.9
32	10 41 23.72	−2.047	+11 50 28.9	+ 5.35	10 0.3	32	10 38 59.56	+1.489	+10 41 3.4	−14.93	7 56.6

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter . . .	7.5	7.5	7.5	7.4	7.3	7.1
Horizontal Parallax	13.1	13.2	13.2	13.0	12.8	12.5

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
	″	″	″	″	″	″
Semidiameter . .	6.9	6.7	6.5	6.2	6.0	5.7
Hor. Parallax . .	12.2	11.8	11.3	10.9	10.5	10.1

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

	MAY.						JUNE.				
Day of Month.	Apparent Right Ascension. *Noon.*	Var. of R. A. for 1 Hour. *Noon.*	Apparent Declination. *Noon.*	Var. of Decl. for 1 Hour. *Noon.*	Meridian Passage.	Day of Month.	Apparent Right Ascension. *Noon.*	Var. of R. A. for 1 Hour. *Noon.*	Apparent Declination. *Noon.*	Var. of Decl. for 1 Hour. *Noon.*	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	10 38 24.93	+1.396	+10 46 55.7	−14.42	7 59.9	1	11 10 28.03	+3.532	+6 25 49.3	−26.61	6 30.2
2	10 38 59.56	1.489	10 41 3.4	14.93	7 56.6	2	11 11 53.39	3.581	6 15 7.1	26.91	6 27.7
3	10 39 36.42	1.582	10 34 59.0	15.43	7 53.3	3	11 13 19.91	3.629	6 4 17.7	27.20	6 25.2
4	10 40 15.48	1.672	10 28 42.7	15.92	7 50.0	4	11 14 47.56	3.675	5 53 21.2	27.49	6 22.7
5	10 40 56.68	1.760	10 22 14.8	16.40	7 46.8	5	11 16 16.31	3.721	5 42 17.9	27.78	6 20.3
6	10 41 39.97	+1.846	+10 15 35.5	−16.89	7 43.6	6	11 17 46.15	+3.765	+5 31 7.8	−28.06	6 17.8
7	10 42 25.32	1.932	10 8 45.1	17.34	7 40.4	7	11 19 17.04	3.809	5 19 51.1	28.34	6 15.4
8	10 43 12.69	2.015	10 1 43.4	17.79	7 37.3	8	11 20 48.98	3.852	5 8 27.8	28.61	6 13.0
9	10 44 2.03	2.096	9 54 31.0	18.23	7 34.2	9	11 22 21.93	3.894	4 56 58.1	28.87	6 10.6
10	10 44 53.30	2.176	9 47 8.0	18.67	7 31.1	10	11 23 55.87	3.934	4 45 22.2	29.13	6 8.3
11	10 45 46.45	+2.253	+ 9 39 34.6	−19.10	7 28.0	11	11 25 30.77	+3.974	+4 33 40.1	−29.38	6 5.9
12	10 46 41.43	2.328	9 31 51.0	19.53	7 25.0	12	11 27 6.61	4.013	4 21 52.0	29.63	6 3.6
13	10 47 38.21	2.402	9 23 57.3	19.94	7 22.0	13	11 28 43.38	4.051	4 9 58.0	29.87	6 1.2
14	10 48 36.74	2.474	9 15 53.6	20.34	7 19.1	14	11 30 21.07	4.089	3 57 58.2	30.11	5 58.9
15	10 49 36.97	2.544	9 7 40.8	20.74	7 16.2	15	11 31 59.65	4.126	3 45 52.8	30.34	5 56.6
16	10 50 38.86	+2.613	+ 8 59 18.2	−21.13	7 13.3	16	11 33 39.10	+4.162	+3 33 41.9	−30.57	5 54.4
17	10 51 42.38	2.679	8 50 46.3	21.52	7 10.4	17	11 35 19.40	4.197	3 21 25.6	30.79	5 52.1
18	10 52 47.48	2.745	8 42 5.3	21.90	7 7.6	18	11 37 0.55	4.232	3 9 3.9	31.01	5 49.9
19	10 53 54.12	2.809	8 33 15.3	22.27	7 4.8	19	11 38 42.53	4.266	2 56 37.0	31.23	5 47.6
20	10 55 2.29	2.871	8 24 16.5	22.63	7 2.0	20	11 40 25.33	4.300	2 44 4.9	31.44	5 45.4
21	10 56 11.93	+2.932	+ 8 15 9.1	−22.99	6 59.2	21	11 42 8.95	+4.334	+2 31 27.9	−31.64	5 43.2
22	10 57 23.03	2.992	8 5 53.1	23.34	6 56.5	22	11 43 53.37	4.367	2 18 45.9	31.85	5 41.0
23	10 58 35.55	3.051	7 56 28.7	23.69	6 53.7	23	11 45 38.58	4.400	2 5 59 1	32.05	5 38.8
24	10 59 49.47	3.108	7 46 55.9	24.04	6 51.0	24	11 47 24.57	4.433	1 53 7.5	32.25	5 36.6
25	11 1 4.76	3.165	7 37 15.0	24.38	6 48.3	25	11 49 11.35	4.465	1 40 11.2	32.44	5 34.5
26	11 2 21.39	+3.220	+ 7 27 26.0	−24.71	6 45.7	26	11 50 58.90	+4.497	+1 27 10.4	−32.63	5 32.3
27	11 3 39.34	3.275	7 17 29.1	25.04	6 43.0	27	11 52 47.22	4.529	1 14 5.1	32.81	5 30.2
28	11 4 58.58	3.328	7 7 24.4	25.36	6 40.4	28	11 54 36.29	4.560	1 0 55.3	32.99	5 28.1
29	11 6 19.10	3.381	6 57 11.9	25.68	6 37.8	29	11 56 26.12	4.591	0 47 41.3	33.17	5 26.0
30	11 7 40.86	3.432	6 46 51.8	25.99	6 35.3	30	11 58 16.69	4.622	0 34 23.1	33.34	5 23.9
31	11 9 3.84	+3.483	+ 6 36 24.3	−26.30	6 32.7	31	12 0 8.00	+4.653	+0 21 0.7	−33.51	5 21.8
32	11 10 28.03	+3.532	+ 6 25 49.3	−26.61	6 30.2	32	12 2 0.04	+4.683	+0 7 34.3	−33.68	5 19.7

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.	Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″	″		″	″	″	″	″	″
Semidiameter . .	5.5	5.3	5.1	4.9	4.7	4.6	4.4	Semidiameter . .	4.3	4.1	4.0	3.9	3.8	3.7
Hor. Parallax . .	9.7	9.3	8.9	8.6	8.3	8.0	4.7	Hor. Parallax . .	7.5	7.2	7.0	6.8	6.6	6.4

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	12 0 8.00	+4.653	+0 21 0.7	−33.51	5 21.8	1	13 3 9.08	+5.496	− 6 56 55.1	−36.36	4 22.8
2	12 2 0.04	4.683	+0 7 34.3	33.68	5 19.7	2	13 5 21.30	5.523	7 11 28.0	36.38	4 21.0
3	12 3 52.79	4.713	−0 5 55.9	33.84	5 17.7	3	13 7 34.17	5.549	7 26 1.2	36.39	4 19.3
4	12 5 46.26	4.743	0 19 20.9	34.00	5 15.6	4	13 9 47.68	5.576	7 40 34.5	36.39	4 17.6
5	12 7 40.43	4.772	0 33 7.5	34.16	5 13.6	5	13 12 1.82	5.602	7 55 7.8	36.39	4 15.9
6	12 9 35.30	+4.801	−0 46 48.7	−34.30	5 11.6	6	13 14 16.61	+5.629	− 8 9 41.0	−36.38	4 14.2
7	12 11 30.85	4.829	1 0 33.3	34.43	5 9.6	7	13 16 32.03	5.655	8 24 13.9	36.36	4 12.5
8	12 13 27.08	4.858	1 14 21.2	34.56	5 7.6	8	13 18 48.09	5.682	8 38 46.3	36.34	4 10.8
9	12 15 23.98	4.886	1 28 12.3	34.69	5 5.6	9	13 21 4.77	5.708	8 53 18.2	36.31	4 9.2
10	12 17 21.55	4.913	1 42 6.5	34.81	5 3.6	10	13 23 22.10	5.735	9 7 49.4	36.28	4 7.6
11	12 19 19.76	+4.939	−1 56 3.5	−34.93	5 1.7	11	13 25 40.06	+5.761	− 9 22 19.6	−36.24	4 5.9
12	12 21 18.62	4.966	2 10 3.3	35.04	4 59.7	12	13 27 58.66	5.788	9 36 48.9	36.20	4 4.3
13	12 23 18.13	4.992	2 24 5.8	35.15	4 57.8	13	13 30 17.90	5.815	9 51 17.1	36.15	4 2.7
14	12 25 18.27	5.019	2 38 10.9	35.26	4 55.8	14	13 32 37.78	5.842	10 5 43.9	36.09	4 1.1
15	12 27 19.04	5.046	2 52 18.4	35.36	4 53.9	15	13 34 58.31	5.869	10 20 9.3	36.03	3 59.5
16	12 29 20.46	+5.072	−3 6 28.2	−35.45	4 52.0	16	13 37 19.48	+5.896	−10 34 33.1	−35.96	3 57.9
17	12 31 22.49	5.098	3 20 40.2	35.54	4 50.1	17	13 39 41.31	5.923	10 48 55.2	35.88	3 56.3
18	12 33 25.16	5.125	3 34 54.4	35.63	4 48.2	18	13 42 3.80	5.951	11 3 15.4	35.80	3 54.7
19	12 35 28.46	5.151	3 49 10.6	35.71	4 46.3	19	13 44 26.96	5.979	11 17 33.7	35.72	3 53.2
20	12 37 32.38	5.177	4 3 28.7	35.79	4 44.4	20	13 46 50.78	6.007	11 31 49.8	35.63	3 51.7
21	12 39 36.94	+5.203	−4 17 48.6	−35.86	4 42.6	21	13 49 15.28	+6.035	−11 46 3.6	−35.53	3 50.1
22	12 41 42.12	5.229	4 32 10.1	35.93	4 40.7	22	13 51 40.47	6.063	12 0 15.1	35.43	3 48.6
23	12 43 47.94	5.255	4 46 33.2	36.00	4 38.9	23	13 54 6.34	6.092	12 14 24.0	35.32	3 47.1
24	12 45 54.39	5.282	5 0 57.9	36.06	4 37.0	24	13 56 32.90	6.121	12 28 30.2	35.20	3 45.6
25	12 48 1.48	5.309	5 15 23.8	36.11	4 35.2	25	13 59 0.15	6.150	12 42 33.6	35.08	3 44.1
26	12 50 9.22	+5.336	−5 29 51.1	−36.16	4 33.4	26	14 1 28.10	+6.179	−12 56 34.0	−34.95	3 42.6
27	12 52 17.59	5.362	5 44 19.5	36.21	4 31.6	27	14 3 56.75	6.209	13 10 31.3	34.82	3 41.2
28	12 54 26.60	5.389	5 58 49.1	36.25	4 29.8	28	14 6 26.12	6.238	13 24 25.3	34.68	3 39.7
29	12 56 36.26	5.416	6 13 19.5	36.29	4 28.0	29	14 8 56.20	6.268	13 38 15.8	34.53	3 38.3
30	12 58 46.56	5.443	6 27 50.8	36.32	4 26.3	30	14 11 26.98	6.297	13 52 2.7	34.37	3 36.9
31	13 0 57.50	+5.469	−6 42 22.7	−36.34	4 24.5	31	14 13 58.47	+6.327	−14 5 45.8	−34.21	3 35.5
32	13 3 9.08	+5.496	−6 56 55.1	−36.36	4 22.8	32	14 16 30.68	+6.357	−14 19 25.0	−34.04	3 34.0

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .	3″.6	3″.5	3″.4	3″.3	3″.3	3″.2	Semidiameter . .	3″.2	3″.1	3″.0	3″.0	2″.9	2″.9
Hor. Parallax . .	6.3	6.1	6.0	5.9	5.7	5.6	Hor. Parallax . .	5.5	5.4	5.3	5.2	5.1	5.1

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

	SEPTEMBER.						OCTOBER				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	14 16 30.68	+6.357	−14 19 25.0	−34.04	3 34.0	1	15 38 15.21	+7.277	−20 23 34.8	−25.52	2 57.6
2	14 19 3.61	6.387	14 33 0.0	33.87	3 32.6	2	15 41 10.23	7.306	20 33 42.5	25.12	2 56.5
3	14 21 37.24	6.416	14 46 30.7	33.69	3 31.3	3	15 44 5.98	7.338	20 43 40.5	24.71	2 55.5
4	14 24 11.58	6.446	14 59 57.0	33.50	3 29.9	4	15 47 2.46	7.368	20 53 28.5	24.29	2 54.6
5	14 26 46.65	6.476	15 13 18.6	33.30	3 28.6	5	15 49 59.66	7.398	21 3 6.3	23.86	2 53.6
6	14 29 22.43	+6.506	−15 26 35.3	−33.09	3 27.2	6	15 52 57.57	+7.428	−21 12 33.8	−23.42	2 52.6
7	14 31 58.93	6.535	15 39 47.0	32.88	3 25.9	7	15 55 56.20	7.458	21 21 50.7	22.98	2 51.6
8	14 34 36.14	6.565	15 52 53.5	32.66	3 24.6	8	15 58 55.54	7.487	21 30 56.8	22.53	2 50.7
9	14 37 14.07	6.595	16 5 54.6	32.43	3 23.3	9	16 1 55.57	7.516	21 39 52.0	22.07	2 49.8
10	14 39 52.72	6.625	16 18 50.1	32.19	3 22.0	10	16 4 56.29	7.545	21 48 36.1	21.60	2 48.8
11	14 42 32.09	+6.655	−16 31 39.9	−31.95	3 20.7	11	16 7 57.71	+7.573	−21 57 8.9	−21.13	2 47.9
12	14 45 12.18	6.686	16 44 23.7	31.70	3 19.4	12	16 10 59.81	7.602	22 5 30.2	20.65	2 47.0
13	14 47 53.00	6.716	16 57 1.4	31.44	3 18.1	13	16 14 2.59	7.630	22 13 39.8	20.15	2 46.1
14	14 50 34.55	6.747	17 9 32.9	31.17	3 16.9	14	16 17 6.04	7.658	22 21 37.5	19.65	2 45.2
15	14 53 16.84	6.777	17 21 57.9	30.90	3 15.7	15	16 20 10.16	7.685	22 29 23.2	19.15	2 44.3
16	14 55 59.86	+6.808	−17 34 16.3	−30.62	3 14.4	16	16 23 14.94	+7.713	−22 36 56.6	−18.64	2 43.4
17	14 58 43.62	6.839	17 46 27.8	30.34	3 13.2	17	16 26 20.38	7.740	22 44 17.7	18.13	2 42.6
18	15 1 28.12	6.870	17 58 32.4	30.05	3 12.0	18	16 29 26.48	7.767	22 51 26.3	17.60	2 41.8
19	15 4 13.37	6.901	18 10 29.8	29.75	3 10.8	19	16 32 33.22	7.794	22 58 22.2	17.06	2 41.0
20	15 6 59.37	6.932	18 22 19.8	29.43	3 9.7	20	16 35 40.61	7.821	23 5 5.2	16.52	2 40.1
21	15 9 46.12	+6.964	−18 34 2.4	−29.11	3 8.5	21	16 38 48.63	+7.847	−23 11 35.2	−15.98	2 39.3
22	15 12 33.63	6.995	18 45 37.3	28.79	3 7.3	22	16 41 57.27	7.873	23 17 52.0	15.42	2 38.5
23	15 15 21.90	7.027	18 57 4.3	28.46	3 6.2	23	16 45 6.53	7.899	23 23 55.4	14.86	2 37.7
24	15 18 10.92	7.058	19 8 23.3	28.12	3 5.1	24	16 48 16.40	7.924	23 29 45.4	14.29	2 37.0
25	15 21 0.70	7.090	19 19 34.0	27.77	3 4.0	25	16 51 26.86	7.948	23 35 21.6	13.72	2 36.2
26	15 23 51.24	+7.122	−19 30 36.3	−27.41	3 2.9	26	16 54 37.90	+7.972	−23 40 44.0	−13.14	2 35.4
27	15 26 42.54	7.153	19 41 30.0	27.05	3 1.8	27	16 57 49.51	7.995	23 45 52.5	12.56	2 34.7
28	15 29 34.58	7.184	19 52 14.9	26 68	3 0.7	28	17 1 1.68	8.018	23 50 46.9	11.97	2 34.0
29	15 32 27.38	7.215	20 2 50.8	26.30	2 59.7	29	17 4 14.39	8.041	23 55 26.9	11.37	2 33.2
30	15 35 20.92	7.246	20 13 17.5	25.91	2 58.6	30	17 7 27.63	8.062	23 59 52.6	10.77	2 32.5
31	15 38 15.21	+7.277	−20 23 34.8	−25.52	2 57.6	31	17 10 41.39	+8.083	−24 4 3.7	−10.16	2 31.8
32	15 41 10.23	+7.306	−20 33 42.5	−25.12	2 56.5	32	17 13 55.64	+8.103	−24 8 0.1	− 9.54	2 31.1

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.	Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″		″	″	″	″	″	″
Semidiameter . .	2.8	2.8	2.8	2.7	2.7	2.7	Semidiameter . .	2.6	2.6	2.6	2.6	2.5	2.5
Hor. Parallax . .	5.0	4.9	4.9	4.8	4.7	4.7	Hor. Parallax . .	4.6	4.6	4.5	4.5	4.5	4.4

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	17 13 55.64	+8.103	−24 8 0.1	− 9.54	2 31.1
2	17 17 10.36	8.123	24 11 41.7	8.92	2 30.4
3	17 20 25.56	8.142	24 15 8.4	8.30	2 29.7
4	17 23 41.20	8.161	24 18 19.9	7.67	2 29.0
5	17 26 57.27	8.179	24 21 16.1	7.03	2 28.3
6	17 30 13.76	+8.196	−24 23 57.2	− 6.39	2 27.7
7	17 33 30.65	8.212	24 26 22.9	5.74	2 27.0
8	17 36 47.91	8.228	24 28 32.9	5.09	2 26.4
9	17 40 5.55	8.243	24 30 27.3	4.44	2 25.7
10	17 43 23.55	8.257	24 32 6.0	3.79	2 25.1
11	17 46 41.88	+8.271	−24 33 28.8	− 3.13	2 24.4
12	17 50 0.53	8.284	24 34 35.8	2.46	2 23.8
13	17 53 19.48	8.296	24 35 26.7	1.79	2 23.2
14	17 56 38.74	8.308	24 36 1.6	1.12	2 22.6
15	17 59 58.27	8.319	24 36 20.4	− 0.44	2 21.9
16	18 3 18.07	+8.330	−24 36 23.0	+ 0.24	2 21.3
17	18 6 38.11	8.342	24 36 9.3	0.91	2 20.7
18	18 9 58.39	8.353	24 35 39.3	1.59	2 20.1
19	18 13 18.89	8.362	24 34 53.0	2.27	2 19.5
20	18 16 39.59	8.369	24 33 50.3	2.96	2 18.9
21	18 20 0.47	+8.375	−24 32 31.1	+ 3.64	2 18.3
22	18 23 21.52	8.380	24 30 55.5	4.32	2 17.7
23	18 26 42.72	8.386	24 29 3 5	5.00	2 17.1
24	18 30 4.04	8.391	24 26 54.9	5.69	2 16.6
25	18 33 25.48	8.395	24 24 29.9	6.39	2 16.0
26	18 36 47.01	+8.398	−24 21 48.3	+ 7.08	2 15.4
27	18 40 8.61	8.401	24 18 50.2	7.76	2 14.8
28	18 43 30.26	8.403	24 15 35.6	8.45	2 14.3
29	18 46 51.95	8.404	24 12 4.5	9.14	2 13.7
30	18 50 13.65	8.404	24 8 16.9	9.83	2 13.1
31	18 53 35.34	+8.403	−24 4 12.8	+10.51	2 12.5
32	18 56 57.00	+8.401	−23 59 52.4	+11.20	2 11.9

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter . .	2.5	2.5	2.5	2.4	2.4	2.4
Hor. Parallax . .	4.4	4.3	4.3	4.3	4.2	4.2

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	18 53 35.34	+8.403	−24 4 12.8	+10.51	2 12.5
2	18 56 57.00	8.401	23 59 52.4	11.20	2 11.9
3	19 0 18.62	8.399	23 55 15.5	11.88	2 11.3
4	19 3 40.17	8.396	23 50 22.3	12.56	2 10.8
5	19 7 1 65	8.392	23 45 12.7	13.24	2 10.2
6	19 10 23.02	+8.388	−23 39 46.9	+13.92	2 9.6
7	19 13 44.28	8.383	23 34 4.9	14.59	2 9.0
8	19 17 5.41	8.377	23 28 6.7	15.26	2 8.4
9	19 20 26.40	8.371	23 21 52.4	15.93	2 7.8
10	19 23 47.23	8.364	23 15 22.1	16.60	2 7.2
11	19 27 7.88	+8.357	−23 8 35.9	+17.26	2 6.6
12	19 30 28.34	8.349	23 1 33.9	17.92	2 6.0
13	19 33 48.61	8 340	22 54 16.0	18.57	2 5.4
14	19 37 8.67	8.331	22 46 42.5	19.22	2 4.8
15	19 40 28.51	8.322	22 38 53.4	19.87	2 4.2
16	19 43 48.12	+8.312	−22 30 48.8	+20.51	2 3.6
17	19 47 7.48	8.302	22 22 28.8	21.15	2 2.9
18	19 50 26.58	8.291	22 13 53.6	21.78	2. 2.3
19	19 53 45.41	8.279	22 5 3.3	22.41	2 1.7
20	19 57 3.96	8.267	21 55 57.9	23.03	2 1.0
21	20 0 22.23	+8.255	−21 46 37.7	+23 65	2 0.4
22	20 3 40.20	8.242	21 37 2.7	24.26	1 59.8
23	20 6 57.85	8.229	21 27 13.0	24.87	1 59.1
24	20 10 15.18	8.215	21 17 8.9	25.47	1 58.4
25	20 13 32.18	8.201	21 6 50.5	26.06	1 57.8
26	20 16 48.83	+8.187	−20 56 17.8	+26.65	1 57.1
27	20 20 5.12	8.172	20 45 31.1	27.23	1 56.4
28	20 23 21.04	8.156	20 34 30.6	27 81	1 55.7
29	20 26 36.59	8.140	20 23 16.4	28.38	1 55.1
30	20 29 51.75	8.124	20 11 48.6	28.95	1 54.4
31	20 33 6.51	+8.107	−20 0 7.5	+29.51	1 53.7
32	20 36 20.86	+8.090	−19 48 13.2	+30.05	1 53.0

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
	″	″	″	″	″	″	″
Semidiameter . .	2.4	2.4	2.4	2.3	2.3	2.3	2.3
Hor. Parallax . .	4.2	4.2	4.1	4.1	4.1	4.0	4.0

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	12 22 3.10	+0.555	−0 57 17.7	−2.86	17 35.1	1	12 23 27.60	−0.337	−0 57 12.9	+2.89	15 34.3
2	12 22 16.09	0.528	0 58 24.1	2.68	17 31.4	2	12 23 19.17	0.365	0 56 1.5	3.07	15 30.3
3	12 22 28.43	0.500	0 59 26.3	2.50	17 27.6	3	12 23 10.06	0.394	0 54 45.7	3.25	15 26.2
4	12 22 40.10	0.472	1 0 24.2	2.32	17 23.9	4	12 23 0.26	0.422	0 53 25.6	3.42	15 22.1
5	12 22 51.11	0.445	1 1 17.7	2.14	17 20.2	5	12 22 49.78	0.450	0 52 1.3	3.60	15 18.0
6	12 23 1.44	+0.417	−1 2 6.8	−1.95	17 16.4	6	12 22 38.64	−0.478	−0 50 32.8	+3.77	15 13.8
7	12 23 11.11	0.389	1 2 51.5	1.77	17 12.6	7	12 22 26.84	0.505	0 49 0.3	3.94	15 9.7
8	12 23 20.09	0.360	1 3 31.7	1.58	17 8.8	8	12 22 14.37	0.533	0 47 23.6	4.11	15 5.6
9	12 23 28.40	0.332	1 4 7.6	1.40	17 5.0	9	12 22 1.26	0.560	0 45 43.0	4.28	15 1.4
10	12 23 36.02	0.303	1 4 38.9	1.21	17 1.2	10	12 21 47.51	0.586	0 43 58.4	4.45	14 57.2
11	12 23 42.96	+0.275	−1 5 5.8	−1.03	16 57.3	11	12 21 33.13	−0.612	−0 42 9.9	+4.61	14 53.1
12	12 23 49.21	0.246	1 5 28.2	0.84	16 53.5	12	12 21 18.13	0.638	0 40 17.6	4.76	14 48.9
13	12 23 54.76	0.217	1 5 46.2	0.65	16 49.7	13	12 21 2.51	0.663	0 38 21.5	4.92	14 44.7
14	12 23 59.63	0.188	1 5 59.6	0.47	16 45.8	14	12 20 46.29	0.688	0 36 21.7	5.07	14 40.5
15	12 24 3.81	0.160	1 6 8.6	0.28	16 41.9	15	12 20 29.48	0.713	0 34 18.2	5.22	14 36.3
16	12 24 7.29	+0.131	−1 6 13.1	−0.09	16 38.0	16	12 20 12.08	−0.737	−0 32 11.2	+5.36	14 32.0
17	12 24 10.07	0 101	1 6 13.1	+0.09	16 34.1	17	12 19 54.11	0.761	0 30 0.7	5.51	14 27.8
18	12 24 12.16	0.072	1 6 8.6	0.28	16 30.2	18	12 19 35.57	0.784	0 27 46.8	5.65	14 23.5
19	12 24 13.55	0.043	1 5 59.6	0.47	16 26.3	19	12 19 16.49	0.806	0 25 29.6	5.78	14 19.3
20	12 24 14.23	+0.014	1 5 45.9	0.66	16 22 4	20	12 18 56.86	0.829	0 23 9.1	5.92	14 15.0
21	12 24 14.21	−0.016	−1 5 27.8	+0.85	16 18.4	21	12 18 36.71	−0.851	−0 20 45.5	+6.05	14 10.8
22	12 24 13.48	0.045	1 5 5.2	1.04	16 14.5	22	12 18 16.04	0.872	0 18 18.9	6.17	14 6.5
23	12 24 12.05	0.074	1 4 38.0	1.22	16 10.5	23	12 17 54.86	0.893	0 15 49.3	6.29	14 2.2
24	12 24 9.92	0.103	1 4 6.3	1.41	16 6.5	24	12 17 33.19	0.913	0 13 16.8	6.41	13 57.9
25	12 24 7.09	0.133	1 3 30.2	1.60	16 2.6	25	12 17 11.04	0.933	0 10 41.4	6.53	13 53.6
26	12 24 3.55	−0.162	−1 2 49.6	+1.78	15 58.6	26	12 16 48.42	−0.952	−0 8 3.3	+6.64	13 49.3
27	12 23 59.31	0.191	1 2 4.6	1.97	15 54.6	27	12 16 25.36	0.970	0 5 22.6	6.75	13 45.0
28	12 23 54.37	0.220	1 1 15.1	2.15	15 50.5	28	12 16 1.85	0.988	−0 2 39.5	6.85	13 40.6
29	12 23 48.72	0.250	1 0 21.2	2.33	15 46.5	29	12 15 37.92	1.005	+0 0 6.1	6.94	13 36.3
30	12 23 42.38	0.279	0 59 22.8	2.52	15 42.5	30	12 15 13.59	1.022	0 2 53.8	7.03	13 32.0
31	12 23 35.34	−0.308	−0 58 20.1	+2.71	15 38.4	31	12 14 48 87	−1.037	+0 5 43.7	+7.12	13 27.6
32	12 23 27.60	−0.337	−0 57 12.9	+2.89	15 34.3	32	12 14 23.79	−1.052	+0 8 35.7	+7.20	13 23.3

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	17″.9	18″.4	19″.0	19″.6	Polar Semidiameter . .	19″.6	20″.1	20″.5	20″.9
Horizontal Parallax . .	1.7	1.7	1.8	1.8	Horizontal Parallax . .	1.8	1.9	1.9	2.0

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	12 15 37.92	−1.006	+0 0 6.1	+6.94	13 36.3	1	12 1 29.65	−1.145	+1 33 53.5	+7.32	11 20.3
2	12 15 13.59	1.022	0 2 53.8	7.03	13 32.0	2	12 1 2.27	1.137	1 36 48.2	7.24	11 16.0
3	12 14 48.87	1.037	0 5 43.7	7.12	13 27.6	3	12 0 35.11	1.127	1 39 41.1	7.16	11 11.6
4	12 14 23.79	1.052	0 8 35.7	7.20	13 23.3	4	12 0 8.18	1.117	1 42 32.0	7.08	11 7.2
5	12 13 58.35	1.067	0 11 29.6	7.28	13 18.9	5	11 59 41.52	1.106	1 45 20.9	6.99	11 2.8
6	12 13 32.58	−1.080	+0 14 25.2	+7.35	13 14.6	6	11 59 15.14	−1.093	+1 48 7.6	+6.90	10 58.5
7	12 13 6.50	1.093	0 17 22.6	7.42	13 10.2	7	11 58 49.06	1.080	1 50 52.0	6.80	10 54.1
8	12 12 40.12	1.105	0 20 21.5	7.48	13 5.8	8	11 58 23.28	1.067	1 53 34.0	6.69	10 49.7
9	12 12 13.46	1.116	0 23 21.8	7.54	13 1.5	9	11 57 57.83	1.052	1 56 13.4	6.58	10 45.4
10	12 11 46.55	1.126	0 26 23.4	7.59	12 57.1	10	11 57 32.73	1.038	1 58 50.1	6.47	10 41.0
11	12 11 19.40	−1.136	+0 29 26.1	+7.63	12 52.7	11	11 57 7.99	−1.023	+2 1 24.1	+6.36	10 36.7
12	12 10 52.04	1.144	0 32 29.8	7.67	12 48.3	12	11 56 43.62	1.007	2 3 55.2	6.24	10 32.4
13	12 10 24.49	1.152	0 35 34.3	7.70	12 43.9	13	11 56 19.64	0.990	2 6 23.4	6.12	10 28.0
14	12 9 56.75	1.159	0 38 39.6	7.73	12 39.5	14	11 55 56.07	0.973	2 8 48.6	5.99	10 23.7
15	12 9 28.86	1.165	0 41 45.5	7.76	12 35.1	15	11 55 32.93	0.955	2 11 10.8	5.85	10 19.4
16	12 9 0.84	−1.170	+0 44 52.0	+7.78	12 30.7	16	11 55 10.22	−0.937	+2 13 29.8	+5.71	10 15.1
17	12 8 32.70	1.175	0 47 58.7	7.78	12 26.3	17	11 54 47.96	0.918	2 15 45.5	5.57	10 10.8
18	12 8 4.46	1.178	0 51 5.6	7.79	12 21.9	18	11 54 26.16	0.899	2 17 57.9	5.43	10 6.5
19	12 7 36.14	1.181	0 54 12.7	7.79	12 17.5	19	11 54 4.84	0.879	2 20 6.9	5.30	10 2.3
20	12 7 7.76	1.183	0 57 19.7	7.79	12 13.1	20	11 53 43.99	0.858	2 22 12.4	5.15	9 58.0
21	12 6 39.34	−1.184	+1 0 26.5	+7.78	12 8.7	21	11 53 23.64	−0.837	+2 24 14.4	+5.00	9 53.7
22	12 6 10.90	1.185	1 3 33.0	7.76	12 4.3	22	11 53 3.80	0.816	2 26 12.7	4.86	9 49.4
23	12 5 42.47	1.185	1 6 39.1	7.75	11 59.9	23	11 52 44.47	0.794	2 28 7.4	4.70	9 45.2
24	12 5 14.04	1.184	1 9 44.6	7.73	11 55.5	24	11 52 25.68	0.772	2 29 58.4	4.54	9 41.0
25	12 4 45.65	1.182	1 12 49.5	7.69	11 51.1	25	11 52 7.42	0.749	2 31 45.6	4.38	9 36.7
26	12 4 17.32	−1.179	+1 15 53.5	+7.65	11 46.7	26	11 51 49.71	−0.726	+2 33 28.9	+4.22	9 32.5
27	12 3 49.07	1.175	1 18 56.6	7.60	11 42.3	27	11 51 32.56	0.703	2 35 8.3	4.06	9 28.3
28	12 3 20.91	1.171	1 21 58.7	7.56	11 37.9	28	11 51 15.98	0.679	2 36 43.8	3.89	9 24 1
29	12 2 52.87	1.166	1 24 59.5	7.51	11 33.5	29	11 50 59.98	0.654	2 38 15.2	3.72	9 19.9
30	12 2 24.96	1.159	1 27 59.0	7.45	11 29.1	30	11 50 44.57	0.630	2 39 42.5	3.55	9 15.7
31	12 1 57.22	−1.152	+1 30 57.0	+7.39	11 24.7	31	11 50 29.76	−0.605	+2 41 5 7	+3.38	9 11.6
32	12 1 29.65	−1.145	+1 33 53.5	+7.32	11 20.3	32	11 50 15.55	−0.579	+2 42 24.7	+3.21	9 7.4

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	20″.8	21″.0	21″.1	21″.1	Polar Semidiameter . .	21″.0	20″.8	20″.5	20″.1
Horizontal Parallax . .	2.0	2.0	2.0	2.0	Horizontal Parallax . .	2.0	2.0	1.9	1.9

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	11 50 29.76	−0 605	+2 41 5.7	+3.38	9 11.6
2	11 50 15.55	0.579	2 42 24.7	3.21	9 7.4
3	11 50 1.96	0.553	2 43 39.7	3.04	9 3.2
4	11 49 48.99	0.527	2 44 50.4	2.86	8 59.1
5	11 49 36.65	0.501	2 45 56.9	2.68	8 55.0
6	11 49 24.94	−0.475	+2 46 59.2	+2.50	8 50.8
7	11 49 13.86	0.448	2 47 57.1	2.32	8 46.7
8	11 49 3.43	0.421	2 48 50.6	2.14	8 42.6
9	11 48 53.65	0.395	2 49 39.8	1.96	8 38.5
10	11 48 44.51	0.367	2 50 24.5	1.77	8 34.5
11	11 48 36.03	−0.340	+2 51 4.9	+1.59	8 30.4
12	11 48 28.21	0.312	2 51 40.9	1.41	8 26.3
13	11 48 21.05	0.285	2 52 12.6	1.23	8 22.3
14	11 48 14.51	0.257	2 52 39.8	1.05	8 18.3
15	11 48 8.69	0.230	2 53 2.7	0.86	8 14.2
16	11 48 3.51	−0.203	+2 53 21.1	+0.68	8 10.2
17	11 47 58.99	0.175	2 53 35.2	0.49	8 6.2
18	11 47 55.13	0.147	2 53 44.9	0.31	8 2.2
19	11 47 51.93	0.119	2 53 50.2	+0.13	7 58.2
20	11 47 49.39	0.092	2 53 51.2	−0.05	7 54.3
21	11 47 47.51	−0.064	+2 53 47.8	−0.24	7 50.3
22	11 47 46.29	0.037	2 53 40.0	0.42	7 46.4
23	11 47 45.74	−0.009	2 53 27.9	0.60	7 42.4
24	11 47 45.85	+0.018	2 53 11.4	0.78	7 38.5
25	11 47 46.62	0.046	2 52 50.6	0.96	7 34.6
26	11 47 48.06	+0.073	+2 52 25.5	−1.14	7 30.7
27	11 47 50.15	0.101	2 51 56.1	1.32	7 26.8
28	11 47 52.90	0.128	2 51 22.3	1.50	7 22.9
29	11 47 56.31	0.156	2 50 44.3	1.67	7 19.0
30	11 48 0.38	0.183	2 50 2.0	1.85	7 15.2
31	11 48 5.10	+0.210	+2 49 15.4	−2.03	7 11.3
32	11 48 10.47	+0.238	+2 48 24.7	−2.20	7 7.5

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	20″.1	19″.6	19″.1	18″.5
Horizontal Parallax . .	1.9	1.8	1.8	1.7

JUNE.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	11 48 10.47	+0.238	+2 48 24.7	−2.20	7 7.5
2	11 48 16.50	0.265	2 47 29 8	2.37	7 3.7
3	11 48 23.17	0 292	2 46 30.7	2.55	6 59.8
4	11 48 30.49	0.318	2 45 27.5	2.72	6 56.0
5	11 48 38.45	0.345	2 44 20.0	2.89	6 52.2
6	11 48 47.04	+0.371	+2 43 8.5	−3.06	6 48.4
7	11 48 56.27	0.398	2 41 52.9	3.23	6 44.6
8	11 49 6.13	0.424	2 40 33.2	3.40	6 40.9
9	11 49 16.61	0.450	2 39 9.6	3.57	6 37.1
10	11 49 27.71	0.475	2 37 42.0	3.73	6 33.4
11	11 49 39.42	+0.501	+2 36 10.4	−3.89	6 29.7
12	11 49 51.74	0.526	2 34 34.9	4.05	6 25.9
13	11 50 4.67	0.551	2 32 55.6	4.21	6 22.2
14	11 50 18.19	0.575	2 31 12.5	4.37	6 18.5
15	11 50 32.30	0.600	2 29 25.6	4.53	6 14.8
16	11 50 47.00	+0.625	+2 27 34.8	−4.69	6 11.1
17	11 51 2.28	0.649	2 25 40.4	4.85	6 7.5
18	11 51 18.14	0.673	2 23 42.2	5.00	6 3.8
19	11 51 34.56	0.696	2 21 40.4	5.15	6 0.1
20	11 51 51.56	0.720	2 19 35.0	5.30	5 56.5
21	11 52 9.12	+0.743	+2 17 26.1	−5.45	5 52.8
22	11 52 27.24	0.766	2 15 13.6	5.59	5 49.2
23	11 52 45.91	0.789	2 12 57.7	5.74	5 45.6
24	11 53 5.13	0.812	2 10 38.2	5.89	5 42.0
25	11 53 24.90	0.835	2 8 15.2	6.03	5 38.4
26	11 53 45.20	+0.857	+2 5 48.8	−6.17	5 34.8
27	11 54 6.04	0.880	2 3 19.0	6.31	5 31.2
28	11 54 27.41	0.902	2 0 45.8	6.45	5 27.6
29	11 54 49.31	0.923	1 58 9.4	6.59	5 24.1
30	11 55 11.73	0.945	1 55 29.6	6.72	5 20.5
31	11 55 34.66	+0.966	+1 52 46.7	−6.86	5 17.0
32	11 55 58.10	+0.987	+1 50 0.5	−6.99	5 13.4

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	18″.4	17″.9	17″.4	16″.9
Horizontal Parallax . .	1.7	1.7	1.6	1.6

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	11 55 34.66	+0 966	+1 52 46.7	− 6.86	5 17.0	1	12 11 8.39	+1.508	+0 5 23.3	−10.21	3 30.6
2	11 55 58.10	0.987	1 50 0.5	6.99	5 13.4	2	12 11 44.74	1.522	+0 1 17.2	10.29	3 27.3
3	11 56 22.05	1.008	1 47 11.1	7.12	5 9.9	3	12 12 21.43	1.535	−0 2 50.9	10.38	3 23.9
4	11 56 46.48	1.028	1 44 18.6	7.25	5 6.4	4	12 12 58.44	1.549	0 7 0.9	10.46	3 20.6
5	11 57 11.41	1.049	1 41 23.1	7.38	5 2.8	5	12 13 35.76	1.562	0 11 12.7	10.53	3 17.3
6	11 57 36.63	+1.069	+1 38 24.5	− 7.51	4 59.3	6	12 14 13.40	+1.575	−0 15 26.4	- 10.61	3 14.0
7	11 58 2.74	1.089	1 35 22 8	7.63	4 55.8	7	12 14 51.35	1.588	0 19 42.0	10.69	3 10.7
8	11 58 29.09	1.108	1 32 18.3	7.75	4 52.3	8	12 15 29.61	1.600	0 23 59.3	10.76	3 7.4
9	11 58 55.92	1.128	1 29 10.8	7.87	4 48.8	9	12 16 8.15	1.612	0 28 18 4	10.83	3 4.1
10	11 59 23.22	1.147	1 26 0.4	7.99	4 45.4	10	12 16 46.99	1.624	0 32 39.1	10.90	3 0.8
11	11 59 50.97	+1.165	+1 22 47.2	− 8.11	4 41.9	11	12 17 26.12	+1.636	−0 37 1.6	−10.97	2 57.5
12	12 0 19.16	1.183	1 19 31.2	8.22	4 38.4	12	12 18 5.52	1.647	0 41 25.6	11.04	2 54.2
13	12 0 47.78	1.202	1 16 12.5	8.34	4 35.0	13	12 18 45.19	1.659	0 45 51.3	11.10	2 51.0
14	12 1 16.85	1.220	1 12 51.0	8.45	4 31.5	14	12 19 25.14	1.670	0 50 18.5	11.17	2 47.7
15	12 1 46.34	1.238	1 9 26.9	8.56	4 28.1	15	12 20 5.37	1.681	0 54 47.2	11.23	2 44.4
16	12 2 16.25	+1.255	+1 6 0.2	− 8.67	4 24.7	16	12 20 45.86	+1.693	−0 59 17.4	−11.29	2 41.2
17	12 2 46.58	1.272	1 2 30.9	8.77	4 21.2	17	12 21 26.61	1.703	1 3 49.0	11.35	2 37.9
18	12 3 17.33	1.290	0 58 59.0	8.88	4 17.8	18	12 22 7.62	1.714	1 8 22.1	11.41	2 34.7
19	12 3 48.48	1.306	0 55 24.5	8.98	4 14.4	19	12 22 48.89	1.725	1 12 56.5	11.47	2 31.4
20	12 4 20.03	1.323	0 51 47.6	9.09	4 10.9	20	12 23 30.41	1.735	1 17 32.4	11.52	2 28.2
21	12 4 51.98	+1.340	+0 48 8.3	− 9.19	4 7.5	21	12 24 12.17	+1.745	−1 22 9.5	−11.58	2 24.9
22	12 5 24.33	1.356	0 44 26 5	9.29	4 4.2	22	12 24 54.16	1.755	1 26 48.0	11.63	2 21.7
23	12 5 57.07	1.372	0 40 42.3	9.39	4 0.8	23	12 25 36.39	1.764	1 31 27.7	11.68	2 18.5
24	12 6 30.19	1.388	0 36 55.8	9.49	3 57.4	24	12 26 18.84	1.773	1 36 8.7	11.73	2 15.3
25	12 7 3.68	1.404	0 33 7.0	9 58	3 54.0	25	12 27 1.51	1.783	1 40 50.9	11.78	2 12.1
26	12 7 37.56	+1.419	+0 29 15.9	− 9.68	3 50.7	26	12 27 44.40	+1.792	−1 45 34.2	−11.83	2 8.8
27	12 8 11.81	1.434	0 25 22.5	9.77	3 47.3	27	12 28 27.51	1.801	1 50 18.6	11.88	2 5.6
28	12 8 46.41	1.449	0 21 27.0	9.86	3 44.0	28	12 29 10.85	1.810	1 55 4.2	11.92	2 2.4
29	12 9 21.37	1.464	0 17 29.2	9.95	3 40.6	29	12 29 54.39	1.819	1 59 50.7	11.96	1 59.2
30	12 9 56 69	1.479	0 13 29.3	10.04	3 37.3	30	12 30 38.13	1.827	2 4 38.3	12.00	1 56.0
31	12 10 32.37	+1.494	+0 9 27.3	−10.13	3 33.9	31	12 31 22.08	+1.835	−2 9 26.9	−12.04	1 52.8
32	12 11 8.39	+1 508	+0 5 23.3	−10.21	3 30.6	32	12 32 6.22	+1.843	−2 14 16.4	−12.08	1 49.6

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	16″.9	16″.5	16″.1	15″.7	Polar Semidiameter . .	15″.7	15″.4	15″.1	14″.9
Horizontal Parallax . .	1.6	1.5	1.5	1.5	Horizontal Parallax . .	1.5	1.4	1.4	1.4

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	12 32 6.22	+1.843	−2 14 16.4	−12.08	1 49.6	1	12 55 17.88	+1.997	−4 43 28.2	−12.58	0 14.7
2	12 32 50.54	1.850	2 19 6.9	12.12	1 46.4	2	12 56 5.84	1.999	4 48 30.0	12.57	0 11.6
3	12 33 35.04	1.858	2 23 58.2	12.16	1 43.2	3	12 56 53.85	2.001	4 53 31.7	12.57	0 8.4
4	12 34 19.73	1.865	2 28 50.4	12.19	1 40.0	4	12 57 41.90	2.003	4 58 33.2	12.56	0 5.3
5	12 35 4.59	1.873	2 33 43.3	12.22	1 36.8	5	12 58 29.99	2.005	5 3 34.5	12.55	0 2.2 23 59.8
6	12 35 49.61	+1.880	−2 38 36.9	−12.25	1 33.6	6	12 59 18.13	+2.006	−5 8 35.6	−12.54	23 56.9
7	12 36 34.80	1.887	2 43 31.3	12.28	1 30.4	7	13 0 6.30	2.008	5 13 36.3	12.52	23 52.8
8	12 37 20.15	1.893	2 48 26.4	12.31	1 27.3	8	13 0 54.50	2.009	5 18 36.7	12.51	23 49.6
9	12 38 5.65	1.899	2 53 22.1	12.34	1 24.1	9	13 1 42.72	2.010	5 23 36.7	12.49	23 46.5
10	12 38 51.30	1.905	2 58 18.5	12.37	1 20.9	10	13 2 30.97	2.011	5 28 36.4	12.48	23 43.4
11	12 39 37.10	+1.911	−3 3 15.4	−12.39	1 17.7	11	13 3 19.24	+2.011	−5 33 35.7	−12.46	23 40.2
12	12 40 23.04	1.917	3 8 12.9	12.41	1 14.6	12	13 4 7.52	2.012	5 38 34.6	12.44	23 37.1
13	12 41 9.13	1.923	3 13 11.0	12.43	1 11.4	13	13 4 55.81	2.012	5 43 32.9	12.42	23 34.0
14	12 41 55.34	1.928	3 18 9.5	12.45	1 8.2	14	13 5 44.10	2.012	5 48 30.7	12.40	23 30.8
15	12 42 41.68	1.933	3 23 8.5	12.47	1 5.1	15	13 6 32.40	2.012	5 53 28.1	12.38	23 27.7
16	12 43 28.14	+1.939	−3 28 7.7	−12.49	1 1.9	16	13 7 20.70	+2.012	−5 58 24.8	−12.35	23 24.6
17	12 44 14.74	1.944	3 33 7.5	12.50	0 58.7	17	13 8 8.99	2.012	6 3 21.0	12.32	23 21.5
18	12 45 1.46	1.949	3 38 7.6	12.52	0 55.6	18	13 8 57.27	2.012	6 8 16.6	12.30	23 18.3
19	12 45 48.30	1.954	3 43 8.0	12.53	0 52.4	19	13 9 45.54	2.011	6 13 11.6	12.28	23 15.2
20	12 46 35.24	1.958	3 48 8.8	12.54	0 49.3	20	13 10 33.78	2.010	6 18 5.9	12.25	23 12.1
21	12 47 22.30	+1.963	−3 53 9.9	−12.55	0 46.1	21	13 11 22.00	+2.009	−6 22 59.5	−12.22	23 8.9
22	12 48 9.46	1.967	3 58 11.2	12.56	0 43.0	22	13 12 10.20	2.008	6 27 52.3	12.18	23 5.8
23	12 48 56.72	1.971	4 3 12.7	12.57	0 39.8	23	13 12 58.37	2.006	6 32 44.3	12.15	23 2.6
24	12 49 44.08	1.975	4 8 14.4	12.58	0 36.7	24	13 13 46.49	2.004	6 37 35.5	12.12	22 59.5
25	12 50 31.53	1.979	4 13 16.3	12.58	0 33.5	25	13 14 34.57	2.002	6 42 25.8	12.08	22 56.4
26	12 51 19.06	+1.982	−4 18 18.2	−12.58	0 30.4	26	13 15 22.61	+2.000	−6 47 15.2	−12.05	22 53.2
27	12 52 6.68	1.986	4 23 20.2	12.58	0 27.2	27	13 16 10.59	1.998	6 52 3.8	12.00	22 50.1
28	12 52 54.38	1.989	4 28 22.2	12.59	0 24.1	28	13 16 58.51	1.995	6 56 51.3	11.96	22 47.0
29	12 53 42.15	1.992	4 33 24.3	12.58	0 21.0	29	13 17 46.35	1.993	7 1 37.9	11.92	22 43.8
30	12 54 29.98	1.994	4 38 26.3	12.58	0 17.8	30	13 18 34.13	1.989	7 6 23.5	11.88	22 40.7
31	12 55 17.88	+1.997	−4 43 28.2	−12.58	0 14.7	31	13 19 21.84	+1.986	−7 11 8.1	−11.83	22 37.5
32	12 56 5.84	+1.999	−4 48 30.0	−12.57	0 11.6	32	13 20 9.45	+1.982	−7 15 51.5	−11.79	22 34.4

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
	″	″	″	″		″	″	″	″
Polar Semidiameter . .	14.9	14.7	14.6	14.6	Polar Semidiameter . .	14.6	14.6	14.6	14.7
Horizontal Parallax . .	1.4	1.4	1.4	1.4	Horizontal Parallax . .	1.4	1.4	1.4	1.4

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	13 20 9.45	+1.982	−7 15 51.5	−11.79	22 34.4
2	13 20 56.98	1.978	7 20 33.8	11.75	22 31.3
3	13 21 44.41	1.974	7 25 14.9	11.69	22 28.1
4	13 22 31.75	1.970	7 29 54.9	11.64	22 25.0
5	13 23 18.98	1.966	7 34 33.6	11.59	22 21.8
6	13 24 6.10	+1.961	−7 39 11.0	−11.53	22 18.7
7	13 24 53.12	1.956	7 43 47.2	11.48	22 15.5
8	13 25 40.01	1.951	7 48 22.0	11.42	22 12.4
9	13 26 26.78	1.946	7 52 55.5	11.37	22 9.2
10	13 27 13.42	1.941	7 57 27.6	11.31	22 6.0
11	13 27 59.94	+1.935	−8 1 58.3	−11.25	22 2.9
12	13 28 46.31	1.929	8 6 27.6	11.19	21 59.7
13	13 29 32.54	1.923	8 10 55.4	11.13	21 56.5
14	13 30 18.62	1.917	8 15 21.7	11.07	21 53.4
15	13 31 4.56	1.910	8 19 46.5	11.00	21 50.2
16	13 31 50.34	+1.903	−8 24 9.8	−10.94	21 47.0
17	13 32 35.95	1.896	8 28 31.5	10.87	21 43.8
18	13 33 21.39	1.890	8 32 51.6	10.81	21 40.7
19	13 34 6.66	1.883	8 37 10.0	10.74	21 37.5
20	13 34 51.75	1.875	8 41 26.8	10.67	21 34.3
21	13 35 36.66	+1.867	−8 45 41.9	−10.59	21 31.1
22	13 36 21.36	1.859	8 49 55.2	10.52	21 27.9
23	13 37 5.87	1.850	8 54 6.8	10.45	21 24.7
24	13 37 50.17	1.841	8 58 16.5	10.37	21 21.5
25	13 38 34.26	1.832	9 2 24.4	10.29	21 18.3
26	13 39 18.12	+1.823	−9 6 30.4	−10.21	21 15.1
27	13 40 1.76	1.813	9 10 34.5	10.13	21 11.9
28	13 40 45.16	1.803	9 14 36.7	10.05	21 8.7
29	13 41 28.32	1.793	9 18 36.9	9.97	21 5.5
30	13 42 11.24	1.783	9 22 35.0	9.88	21 2.2
31	13 42 53.90	+1.772	−9 26 31.2	− 9.79	20 59.0
32	13 43 36.30	+1.761	−9 30 25.2	− 9.71	20 55.8

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	13 42 53.90	+1.772	− 9 26 31.2	−9.79	20 59.0
2	13 43 36.30	1.761	9 30 25.2	9.71	20 55.8
3	13 44 18.42	1.750	9 34 17.1	9.62	20 52.5
4	13 45 0.28	1.738	9 38 6.9	9.53	20 49.3
5	13 45 41.85	1.726	9 41 54.6	9.44	20 46.0
6	13 46 23.14	+1.714	− 9 45 40.1	−9.35	20 42.8
7	13 47 4.15	1.702	9 49 23.3	9.25	20 39.5
8	13 47 44.86	1.690	9 53 4.3	9.16	20 36.3
9	13 48 25.27	1.677	9 56 43.0	9.07	20 33.0
10	13 49 5.37	1.664	10 0 19.4	8.97	20 29.7
11	13 49 45.16	+1.651	−10 3 53.6	−8.87	20 26.5
12	13 50 24.62	1.638	10 7 25.4	8.78	20 23.2
13	13 51 3.76	1.624	10 10 54.8	8.68	20 19.9
14	13 51 42.56	1.610	10 14 21.9	8.58	20 16.6
15	13 52 21.02	1.595	10 17 46.5	8.47	20 13.3
16	13 52 59.13	+1.580	−10 21 8.6	−8.37	20 10.0
17	13 53 36.89	1.566	10 24 28.3	8.27	20 6.7
18	13 54 14.29	1.551	10 27 45.5	8.16	20 3.4
19	13 54 51.32	1.535	10 31 0.0	8.05	20 0.0
20	13 55 27.97	1.519	10 34 12.0	7.95	19 56.7
21	13 56 4.23	+1.503	−10 37 21.4	−7.84	19 53.4
22	13 56 40.10	1.486	10 40 28.2	7.73	19 50.0
23	13 57 15.57	1.469	10 43 32.3	7.61	19 46.7
24	13 57 50.63	1.452	10 46 33.7	7.50	19 43.4
25	13 58 25.27	1.434	10 49 32.3	7.38	19 40.0
26	13 58 59.48	+1.416	−10 52 28.2	−7.27	19 36.6
27	13 59 33.26	1.398	10 55 21.3	7.15	19 33.2
28	14 0 6.60	1.380	10 58 11.5	7.04	19 29.8
29	14 0 39.49	1.361	11 0 58.9	6.92	19 26.4
30	14 1 11.93	1.342	11 3 43.4	6.79	19 23.0
31	14 1 43.90	+1.323	−11 6 25.0	−6.67	19 19.6
32	14 2 15.41	+1.303	−11 9 3.7	−6.55	19 16.2

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	14″.7	14″.9	15″.1	15″.3
Horizontal Parallax . .	1.4	1.4	1.4	1.4

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	15″.3	15″.6	16″.0	16″.4
Horizontal Parallax . .	1.4	1.5	1.5	1.5

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

	JANUARY.						FEBRUARY.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	6 19 9.48	−0.884	+22 32 7.0	+0.70	11 32.8	1	6 9 44.41	−0.566	+22 39 48.2	+0.54	9 21.7
2	6 18 48.29	0.881	22 32 23.7	0.69	11 28.6	2	6 9 31.02	0.550	22 40 1.1	0.53	9 17.5
3	6 18 27.18	0.877	22 32 40.3	0.69	11 24.3	3	6 9 18.02	0.533	22 40 13.9	0.53	9 13.4
4	6 18 6.17	0.873	22 32 56.8	0.68	11 20.0	4	6 9 5.42	0.516	22 40 26.5	0.53	9 9.2
5	6 17 45.26	0.868	22 33 13.2	0.68	11 15.7	5	6 8 53.24	0.499	22 40 39.1	0.52	9 5.1
6	6 17 24.49	−0.863	+22 33 29.5	+0.68	11 11.4	6	6 8 41.48	−0.481	+22 40 51.5	+0.52	9 1.0
7	6 17 3.85	0.857	22 33 45.7	0.67	11 7.2	7	6 8 30.14	0.463	22 41 3.9	0.51	8 56.9
8	6 16 43.36	0.850	22 34 1.7	0.67	11 2.9	8	6 8 19.23	0.445	22 41 16.1	0.51	8 52.7
9	6 16 23.03	0.843	22 34 17.6	0.66	10 58.6	9	6 8 8.76	0.427	22 41 28.3	0.50	8 48.6
10	6 16 2.87	0.836	22 34 33.4	0.66	10 54.4	10	6 7 58.73	0.409	22 41 40.4	0.50	8 44.5
11	6 15 42.90	−0.828	+22 34 49.1	+0.65	10 50.1	11	6 7 49.14	−0.390	+22 41 52.4	+0.50	8 40.5
12	6 15 23.12	0.820	22 35 4.6	0.64	10 45.8	12	6 7 40.00	0.371	22 42 4.2	0.49	8 36.4
13	6 15 3.56	0.811	22 35 20.0	0.64	10 41.6	13	6 7 31.31	0.352	22 42 16.0	0.49	8 32.3
14	6 14 44.21	0.801	22 35 35.3	0.63	10 37.3	14	6 7 23.08	0.333	22 42 27.7	0.49	8 28.2
15	6 14 25.09	0.792	22 35 50.4	0.63	10 33.1	15	6 7 15.31	0.314	22 42 39.4	0.48	8 24.2
16	6 14 6.21	−0.781	+22 36 5.4	+0.62	10 28.9	16	6 7 8.00	−0.295	+22 42 50.9	+0.48	8 20.1
17	6 13 47.58	0.771	22 36 20.3	0.62	10 24.6	17	6 7 1.16	0.275	22 43 2.4	0.48	8 16.1
18	6 13 29.21	0.760	22 36 35.0	0.61	10 20.4	18	6 6 54.79	0.256	22 43 13.9	0.47	8 12.1
19	6 13 11.11	0.748	22 36 49.6	0.61	10 16.2	19	6 6 48.88	0.236	22 43 25.2	0.47	8 8.0
20	6 12 53.29	0.736	22 37 4.1	0.60	10 11.9	20	6 6 43.45	0.217	22 43 36.5	0.47	8 4.0
21	6 12 35.76	−0.724	+22 37 18.4	+0.60	10 7.7	21	6 6 38.49	−0.197	+22 43 47.7	+0.46	8 0.0
22	6 12 18.52	0.712	22 37 32.7	0.59	10 3.5	22	6 6 34.00	0.177	22 43 58.8	0.46	7 56.0
23	6 12 1.59	0.699	22 37 46.8	0.59	9 59.3	23	6 6 30.00	0.157	22 44 9.8	0.46	7 52.0
24	6 11 44.97	0.686	22 38 0.8	0.58	9 55.1	24	6 6 26.47	0.137	22 44 20.8	0.45	7 48.0
25	6 11 28.68	0.672	22 38 14.6	0.57	9 50.9	25	6 6 23.43	0.117	22 44 31.7	0.45	7 44.0
26	6 11 12.72	−0.658	+22 38 28.4	+0.57	9 46.7	26	6 6 20.88	−0.096	+22 44 42.5	+0.45	7 40.1
27	6 10 57.10	0.644	22 38 42.0	0.56	9 42.5	27	6 6 18.81	0.076	22 44 53.2	0.44	7 36.1
28	6 10 41.83	0.629	22 38 55.5	0.56	9 38.3	28	6 6 17.22	0.056	22 45 3.8	0.44	7 32.1
29	6 10 26.92	0.614	22 39 8.8	0.55	9 34.2	29	6 6 16.13	0.035	22 45 14.3	0.44	7 28.2
30	6 10 12.37	0.598	22 39 22.0	0.55	9 30.0	30	6 6 15.53	−0.015	22 45 24.8	0.43	7 24.2
31	6 9 58.20	−0.582	+22 39 35.2	+0.54	9 25.8	31	6 6 15.42	+0.005	+22 45 35.2	+0.43	7 20.3
32	6 9 44.41	−0.566	+22 39 48.2	+0.54	9 21.7	32	6 6 15.79	+0.026	+22 45 45.5	+0.43	7 16.4

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	9″.7	9″.7	9″.6	9″.5	Polar Semidiameter . .	9″.5	9″.3	9″.2	9″.0
Horizontal Parallax . .	1.1	1.1	1.1	1.1	Horizontal Parallax . .	1.1	1.1	1.0	1.0

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	6 6 16.13	−0.035	+22 45 14.3	+0.44	7 28.2	1	6 9 40.42	+0.570	+22 49 46.0	+0.26	5 29.8
2	6 6 15.53	−0.015	22 45 24.8	0.43	7 24.2	2	6 9 54.32	0.588	22 49 52.1	0.25	5 26.1
3	6 6 15.42	+0.005	22 45 35.2	0.43	7 20.3	3	6 10 8.64	0.606	22 49 58.1	0.24	5 22.4
4	6 6 15.79	0.026	22 45 45.5	0.43	7 16.4	4	6 10 23.39	0.623	22 50 3.8	0.23	5 18.7
5	6 6 16.66	0.046	22 45 55.7	0.42	7 12.5	5	6 10 38.56	0.641	22 50 9.3	0.23	5 15.0
6	6 6 18.02	+0.067	+22 46 5.8	+0.42	7 8.6	6	6 10 54.14	+0.658	+22 50 14.5	+0.21	5 11.3
7	6 6 19.87	0.087	22 46 15.8	0.42	7 4.7	7	6 11 10.13	0.675	22 50 19.5	0,20	5 7.7
8	6 6 22.21	0.108	22 46 25.7	0.41	7 0.8	8	6 11 26.52	0.691	22 50 24.2	0.19	5 4.0
9	6 6 25.05	0.128	22 46 35.6	0.41	6 56.9	9	6 11 43.32	0.708	22 50 28.7	0.18	5 0.3
10	6 6 28.37	0.148	22 46 45.3	0.40	6 53.0	10	6 12 0.51	0.724	22 50 32.9	0.17	4 56.7
11	6 6 32.18	+0.169	+22 46 54.9	+0.40	6 49.2	11	6 12 18.09	+0.741	+22 50 36.8	+0.16	4 53.1
12	6 6 36.47	0.189	22 47 4.5	0.39	6 45.3	12	6 12 36.05	0.757	22 50 40.5	0.14	4 49.4
13	6 6 41.25	0.209	22 47 13.9	0.39	6 41.5	13	6 12 54.41	0.772	22 50 43.8	0.13	4 45.8
14	6 6 46.50	0.229	22 47 23.2	0.39	6 37.6	14	6 13 13.13	0.788	22 50 46.9	0.12	4 42.2
15	6 6 52.24	0.249	22 47 32.4	0.38	6 33.8	15	6 13 32.23	0.803	22 50 49.6	0.11	4 38.6
16	6 6 58.45	+0.269	+22 47 41.5	+0.38	6 29.9	16	6 13 51.69	+0.819	+22 50 52.0	+0.09	4 35.0
17	6 7 5.13	0.289	22 47 50.4	0.37	6 26.1	17	6 14 11.51	0.834	22 50 54.0	0.08	4 31.4
18	6 7 12.28	0.308	22 47 59.2	0.37	6 22.3	18	6 14 31.70	0.848	22 50 55.8	0.07	4 27.8
19	6 7 19.90	0.327	22 48 7.9	0.36	6 18.5	19	6 14 52.23	0.863	22 50 57.2	0.05	4 24.2
20	6 7 27.99	0.347	22 48 16.5	0.35	6 14.7	20	6 15 13.12	0.877	22 50 58.2	0.04	4 20.6
21	6 7 36.54	+0.366	+22 48 24.9	+0.35	6 10.9	21	6 15 34.35	+0.892	+22 50 58.9	+0.02	4 17.0
22	6 7 45.55	0.385	22 48 33.1	0.34	6 7.2	22	6 15 55.92	0.906	22 50 59.3	+0.01	4 13.4
23	6 7 55.02	0.404	22 48 41.2	0.33	6 3.4	23	6 16 17.83	0.920	22 50 59.2	−0.01	4 9.9
24	6 8 4.95	0.423	22 48 49.2	0.33	5 59.6	24	6 16 40.06	0.933	22 50 58.8	0.02	4 6.3
25	6 8 15.33	0.442	22 48 56.9	0.32	5 55.9	25	6 17 2.63	0.947	22 50 58.0	0.04	4 2.7
26	6 8 26.16	+0.460	+22 49 4.5	+0.31	5 52.1	26	6 17 25.53	+0.960	+22 50 56.9	−0.06	3 59.2
27	6 8 37.43	0.479	22 49 11.9	0.30	5 48.4	27	6 17 48.74	0.973	22 50 55.3	0.08	3 55.7
28	6 8 49.15	0.498	22 49 19.1	0.30	5 44.6	28	6 18 12.26	0.987	22 50 53.3	0.09	3 52.1
29	6 9 1.31	0.516	22 49 26.1	0.29	5 40.9	29	6 18 36.10	1.000	22 50 50.8	0.11	3 48.6
30	6 9 13.91	0.534	22 49 32.9	0.28	5 37.2	30	6 19 0.25	1.012	22 50 48.0	0.13	3 45.0
31	6 9 26.95	+0.552	+22 49 39.6	+0.27	5 33.5	31	6 19 24.69	+1.025	+22 50 44.8	−0.14	3 41.5
32	6 9 40.42	+0.570	+22 49 46.0	+0.26	5 29.8	32	6 19 49.43	+1.037	+22 50 41.1	−0.16	3 38.0

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
	″	″	″	″		″	″	″	″
Polar Semidiameter . .	9.1	8.9	8.7	8.6	Polar Semidiameter . .	8.6	8.4	8.3	8.1
Horizontal Parallax . .	1.0	1.0	1.0	1.0	Horizontal Parallax . .	1.0	1.0	0.9	0.9

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	6 19 24.69	+1.025	+22 50 44.8	−0.14	3 41.5	1	6 34 4.62	+1.309	+22 45 4.3	−0.80	1 54.2
2	6 19 49.43	1.037	22 50 41.1	0.16	3 38.0	2	6 34 36.10	1.315	22 44 44.9	0.82	1 50.8
3	6 20 14.47	1.049	22 50 37.0	0.18	3 34.5	3	6 35 7.72	1.320	22 44 24.9	0.85	1 47.4
4	6 20 39.79	1.061	22 50 32.4	0.20	3 31.0	4	6 35 39.49	1.326	22 44 4.3	0.87	1 44.0
5	6 21 5.39	1.072	22 50 27.4	0.22	3 27.5	5	6 36 11.38	1.331	22 43 43.1	0.89	1 40.6
6	6 21 31.27	+1.083	+22 50 22.0	−0.24	3 24.0	6	6 36 43.39	+1.336	+22 43 21.4	−0.92	1 37.2
7	6 21 57.42	1.095	22 50 16.0	0.26	3 20.5	7	6 37 15.53	1.341	22 42 59.2	0.94	1 33.8
8	6 22 23.84	1.106	22 50 9.7	0.27	3 17.0	8	6 37 47.79	1.346	22 42 36.4	0.96	1 30.4
9	6 22 50.52	1.117	22 50 2.8	0.30	3 13.5	9	6 38 20.15	1.351	22 42 13.0	0.99	1 27.0
10	6 23 17.45	1.127	22 49 55.5	0.32	3 10.0	10	6 38 52.62	1.355	22 41 49.1	1.01	1 23.6
11	6 23 44.63	+1.138	+22 49 47.7	−0.34	3 6.5	11	6 39 25.19	+1.359	+22 41 24.6	−1.03	1 20.2
12	6 24 12.06	1.148	22 49 39.4	0.36	3 3.0	12	6 39 57.86	1.363	22 40 59.5	1.05	1 16.8
13	6 24 39.72	1.157	22 49 30.6	0.38	2 59.6	13	6 40 30.62	1.367	22 40 33.9	1.08	1 13.5
14	6 25 7.61	1.167	22 49 21.3	0.40	2 56.1	14	6 41 3.46	1.370	22 40 7.8	1.10	1 10.1
15	6 25 35.74	1.177	22 49 11.5	0.42	2 52.6	15	6 41 36.38	1.374	22 39 41.1	1.12	1 6.7
16	6 26 4.10	+1.186	+22 49 1.2	−0.44	2 49.2	16	6 42 9.39	+1.377	+22 39 13.8	−1.15	1 3.3
17	6 26 32.67	1.195	22 48 50.4	0.46	2 45.7	17	6 42 42.48	1.380	22 38 46.0	1.17	0 59.9
18	6 27 1.45	1.204	22 48 39.1	0.48	2 42.3	18	6 43 15.63	1.383	22 38 17.6	1.19	0 56.5
19	6 27 30.45	1.213	22 48 27.3	0.50	2 38.8	19	6 43 48.84	1.385	22 37 48.7	1.22	0 53.2
20	6 27 59.66	1.221	22 48 14.9	0.51	2 35.4	20	6 44 22.13	1.388	22 37 19.2	1.24	0 49.8
21	6 28 29.06	+1.229	+22 48 2.0	−0.53	2 31.9	21	6 44 55.47	+1.390	+22 36 49.2	−1.26	0 46.4
22	6 28 58.67	1.237	22 47 48.5	0.55	2 28.5	22	6 45 28.85	1.392	22 36 18.6	1.28	0 43.0
23	6 29 28.46	1.245	22 47 34.5	0.57	2 25.0	23	6 46 2.29	1.394	22 35 47.5	1.31	0 39.6
24	6 29 58.45	1.253	22 47 20.0	0.59	2 21.6	24	6 46 35.78	1.396	22 35 15.9	1.33	0 36.3
25	6 30 28.62	1.261	22 47 5.1	0.62	2 18.2	25	6 47 9.31	1.398	22 34 43.7	1.35	0 32.9
26	6 30 58.97	+1.268	+22 46 49.4	−0.64	2 14.7	26	6 47 42.87	+1.399	+22 34 11.1	−1.37	0 29.5
27	6 31 29.50	1.276	22 46 33.3	0.66	2 11.3	27	6 48 16.46	1.400	22 33 37.9	1.40	0 26.1
28	6 32 0.20	1.283	22 46 16.6	0.69	2 7.9	28	6 48 50.08	1.401	22 33 4.2	1.42	0 22.8
29	6 32 31.07	1.289	22 45 59.4	0.73	2 4.5	29	6 49 23.73	1.402	22 32 29.9	1.44	0 19.4
30	6 33 2.09	1.296	22 45 41.6	0.75	2 1.1	30	6 49 57.38	1.403	22 31 55.2	1.46	0 16.0
31	6 33 33.28	+1.303	+22 45 23.2	−0.78	1 57.6	31	6 50 31.05	+1.403	+22 31 20.0	−1.48	0 12.6
32	6 34 4.62	+1.309	+22 45 4.3	−0.80	1 54.2	32	6 51 4.73	+1.403	+22 30 44.3	−1.50	0 9.3

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	8″.1	8″.0	7″.9	7″.9	Polar Semidiameter . .	7″.9	7″.9	7″.8	7″.8
Horizontal Parallax . .	0.9	0.9	0.9	0.9	Horizontal Parallax . .	0.9	0.9	0.9	0.9

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	6 50 31.05	+1.403	+22 31 20.0	−1.48	0 12.6	1	7 7 35.38	+1.321	+22 9 40.0	−1.96	22 24.3
2	6 51 4.73	1.403	22 30 44.3	1.50	0 9.3	2	7 8 7.01	1.315	22 8 53.0	1.96	22 20.9
3	6 51 38.41	1.403	22 30 8.1	1.52	0 5.9	3	7 8 38.51	1.309	22 8 5.8	1.97	22 17.5
4	6 52 12.09	1.403	22 29 31.4	1.54	0 2.5 23 59.1	4	7 9 9.86	1.303	22 7 18.4	1.98	22 14.1
5	6 52 45.75	1.403	22 28 54.2	1.56	23 55.8	5	7 9 41.06	1.297	22 6 30.8	1.98	22 10.7
6	6 53 19.41	+1.402	+22 28 16.6	−1.58	23 52.4	6	7 10 12.10	+1.290	+22 5 43.1	−1.99	22 7.3
7	6 53 53.05	1.401	22 27 38.5	1.60	23 49.0	7	7 10 42.99	1.284	22 4 55.3	2.00	22 3.8
8	6 54 26.66	1.400	22 27 0.0	1.61	23 45.6	8	7 11 13.71	1.277	22 4 7.3	2.00	22 0.4
9	6 55 0.24	1.399	22 26 21.0	1.63	23 42.3	9	7 11 44.27	1.269	22 3 19.3	2.01	21 57.0
10	6 55 33.80	1.397	22 25 41.5	1.65	23 38.9	10	7 12 14.65	1.262	22 2 31.1	2.01	21 53.5
11	6 56 7.32	+1.395	+22 25 1.6	−1.67	23 35.5	11	7 12 44.86	+1.255	+22 1 42.8	−2.01	21 50.1
12	6 56 40.79	1.394	22 24 21.3	1.69	23 32.1	12	7 13 14.89	1.247	22 0 54.5	2.01	21 46.7
13	6 57 14.22	1.392	22 23 40.6	1.71	23 28.8	13	7 13 44.73	1.239	22 0 6.1	2.02	21 43.2
14	6 57 47.61	1.390	22 22 59.5	1.72	23 25.4	14	7 14 14.39	1.232	21 59 17.7	2.02	21 39.8
15	6 58 20.94	1.388	22 22 17.9	1.74	23 22.0	15	7 14 43.85	1.224	21 58 29.3	2.02	21 36.3
16	6 58 54.21	+1.385	+22 21 36.0	−1.75	23 18.6	16	7 15 13.13	+1.215	+21 57 40.8	−2.02	21 32.9
17	6 59 27.42	1.383	22 20 53.7	1.77	23 15.2	17	7 15 42.19	1.207	21 56 52.4	2.02	21 29.4
18	7 0 0.57	1.380	22 20 11.1	1.79	23 11.8	18	7 16 11.06	1.198	21 56 4.0	2.02	21 26.0
19	7 0 33.65	1.377	22 19 28.0	1.80	23 8.5	19	7 16 39.72	1.190	21 55 15.6	2.02	21 22.5
20	7 1 6.66	1.374	22 18 44.6	1.82	23 5.1	20	7 17 8.16	1.181	21 54 27.2	2.01	21 19.1
21	7 1 39.58	+1.370	+22 18 0.9	−1.83	23 1.7	21	7 17 36.38	+1.171	+21 53 39.0	−2.01	21 15.6
22	7 2 12.43	1.367	22 17 16.8	1.84	22 58.3	22	7 18 4.38	1.162	21 52 50.8	2.00	21 12.1
23	7 2 45.19	1.363	22 16 32.4	1.86	22 54.9	23	7 18 32.16	1.153	21 52 2.7	2.00	21 8.7
24	7 3 17.86	1.359	22 15 47.7	1.87	22 51.5	24	7 18 59.70	1.143	21 51 14.8	1.99	21 5.2
25	7 3 50.44	1.355	22 15 2.6	1.89	22 48.1	25	7 19 27.00	1.132	21 50 27.0	1.99	21 1.7
26	7 4 22.91	+1.351	+22 14 17.3	−1.90	22 44.7	26	7 19 54.06	+1.122	+21 49 39.3	−1.98	20 58.2
27	7 4 55.28	1.346	22 13 31.7	1.91	22 41.3	27	7 20 20.88	1.112	21 48 51.8	1 97	20 54.7
28	7 5 27.54	1.342	22 12 45.8	1.92	22 37.9	28	7 20 47.44	1.101	21 48 4.5	1.96	20 51.2
29	7 5 59.68	1.337	22 11 59.7	1.93	22 34.5	29	7 21 13.74	1.090	21 47 17.5	1.96	20 47.7
30	7 6 31.71	1.332	22 11 13.4	1.94	22 31.1	30	7 21 39.78	1.079	21 46 30.6	1.95	20 44.2
31	7 7 3.61	+1.326	+22 10 26.8	−1.95	22 27.7	31	7 22 5.55	+1.068	+21 45 44.0	−1.94	20 40.7
32	7 7 35.38	+1.321	+22 9 40.0	−1.96	22 24.3	32	7 22 31.04	+1.057	+21 44 57.7	−1.92	20 37.2

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	7″.8	7″.8	7″.8	7″.9	Polar Semidiameter . .	7″.9	7″.9	8″.0	8″.1
Horizontal Parallax . .	0.9	0.9	0.9	0.9	Horizontal Parallax . .	0.9	0.9	0.9	0.9

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	7 22 31.04	+1.057	+21 44 57.7	−1.92	20 37.2	1	7 32 47.73	+0.629	+21 25 18.0	−1.24	18 49.3
2	7 22 56.26	1.045	21 44 11.6	1.91	20 33.7	2	7 33 2.63	0.612	21 24 48.6	1.20	18 45.6
3	7 23 21.19	1.033	21 43 25.9	1.90	20 30.2	3	7 33 17.13	0.595	21 24 20.1	1.17	18 41.9
4	7 23 45.84	1.021	21 42 40.4	1.89	20 26.6	4	7 33 31.20	0.578	21 23 52.5	1.13	18 38.2
5	7 24 10.20	1.009	21 41 55.3	1.87	20 23.1	5	7 33 44.87	0.561	21 23 25.7	1.10	18 34.5
6	7 24 34.26	+0.996	+21 41 10.6	−1.86	20 19.6	6	7 33 58.11	+0.543	+21 22 59.7	−1.06	18 30.8
7	7 24 58.02	0.984	21 40 26.2	1.84	20 16.0	7	7 34 10.94	0.525	21 22 34.7	1.02	18 27.1
8	7 25 21.48	0.971	21 39 42.2	1.83	20 12.5	8	7 34 23.34	0.508	21 22 10.6	0.99	18 23.3
9	7 25 44.64	0.958	21 38 58.6	1.81	20 8.9	9	7 34 35.31	0.490	21 21 47.3	0.95	18 19.6
10	7 26 7.48	0.945	21 38 15.4	1.79	20 5.4	10	7 34 46.85	0.472	21 21 25.1	0.91	18 15.8
11	7 26 30.01	+0.932	+21 37 32.6	−1.77	20 1.8	11	7 34 57.96	+0.454	+21 21 3.6	−0.87	18 12.0
12	7 26 52.22	0.919	21 36 50.3	1.75	19 58.2	12	7 35 8.63	0.436	21 20 43.2	0.83	18 8.3
13	7 27 14.10	0.905	21 36 8.5	1.73	19 54.6	13	7 35 18.86	0.417	21 20 23.8	0.79	18 4.6
14	7 27 35.66	0.891	21 35 27.2	1.71	19 51.1	14	7 35 28.65	0.399	21 20 5.3	0.75	18 0.8
15	7 27 56.88	0.877	21 34 46.4	1.69	19 47.5	15	7 35 38.00	0.380	21 19 47.8	0.71	17 57.0
16	7 28 17.77	+0.863	+21 34 6.1	−1.67	19 43.9	16	7 35 46.90	+0.361	+21 19 31.4	−0.66	17 53.2
17	7 28 38.32	0.849	21 33 26.4	1.64	19 40.3	17	7 35 55.35	0.342	21 19 16.0	0.62	17 49.4
18	7 28 58.53	0.834	21 32 47.2	1.62	19 36.7	18	7 36 3.35	0.324	21 19 1.6	0.58	17 45.6
19	7 29 18.38	0.820	21 32 8.7	1.59	19 33.1	19	7 36 10.90	0.305	21 18 48.2	0.53	17 41.8
20	7 29 37.88	0.805	21 31 30.7	1.57	19 29.5	20	7 36 17.98	0.285	21 18 35.9	0.49	17 38.0
21	7 29 57.03	+0.790	+21 30 53.3	−1.54	19 25.9	21	7 36 24.60	+0.266	+21 18 24.6	−0.45	17 34.2
22	7 30 15.81	0.775	21 30 16.6	1.52	19 22.2	22	7 36 30.76	0.246	21 18 14.4	0.40	17 30.3
23	7 30 34.22	0.759	21 29 40.6	1.49	19 18.6	23	7 36 36.44	0.227	21 18 5.3	0.36	17 26.5
24	7 30 52.26	0.744	21 29 5.2	1.46	19 15.0	24	7 36 41.66	0.208	21 17 57.3	0.31	17 22.6
25	7 31 9.93	0.728	21 28 30.5	1.43	19 11.3	25	7 36 46.41	0.188	21 17 50.4	0.27	17 18.8
26	7 31 27.21	+0.712	+21 27 56.5	−1.40	19 7.7	26	7 36 50.69	+0.168	+21 17 44.6	−0.22	17 14.9
27	7 31 44.10	0.696	21 27 23.3	1.37	19 4.0	27	7 36 54.49	0.148	21 17 39.9	0.17	17 11.0
28	7 32 0.60	0.680	21 26 50.7	1.34	19 0.3	28	7 36 57.81	0.129	21 17 36.3	0.13	17 7.2
29	7 32 16.71	0.663	21 26 19.0	1.31	18 56.7	29	7 37 0.66	0.109	21 17 33.8	0.08	17 3.3
30	7 32 32.42	0.646	21 25 48.1	1.27	18 53.0	30	7 37 3.04	0.089	21 17 32.5	−0.03	16 59.4
31	7 32 47.73	+0.629	+21 25 18.0	−1.24	18 49.3	31	7 37 4.93	+0.069	+21 17 32.3	+0.01	16 55.5
32	7 33 2.63	+0.612	+21 24 48.6	−1.20	18 45.6	32	7 37 6.34	+0.049	+21 17 33.2	+0.06	16 51.6

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	8″.1	8″.2	8″.3	8″.5	Polar Semidiameter . .	8″.5	8″.6	8″.8	9″.0
Horizontal Parallax . .	0.9	0.9	0.9	1.0	Horizontal Parallax . .	1.0	1.0	1.0	1.0

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	7 37 6.34	+0.049	+21 17 33.2	+0.06	16 51.6
2	7 37 7.28	0.029	21 17 35.2	0.11	16 47.6
3	7 37 7.74	+0.009	21 17 38.4	0.15	16 43.7
4	7 37 7.72	−0.011	21 17 42.7	0.20	16 39.8
5	7 37 7.23	0.031	21 17 48.1	0.25	16 35.8
6	7 37 6.26	−0.051	+21 17 54.7	+0.30	16 31.9
7	7 37 4.82	0.070	21 18 2.4	0.34	16 27.9
8	7 37 2.90	0.090	21 18 11.2	0.39	16 23.9
9	7 37 0.51	0.109	21 18 21.1	0.44	16 20.0
10	7 36 57.64	0.129	21 18 32.2	0.48	16 16.0
11	7 36 54.31	−0.149	+21 18 44.4	+0.53	16 12.0
12	7 36 50.50	0.168	21 18 57.7	0.58	16 8.0
13	7 36 46.23	0.188	21 19 12.1	0.62	16 4.0
14	7 36 41.50	0.207	21 19 27.6	0.67	16 0.0
15	7 36 36.29	0.227	21 19 44.3	0.72	15 56.0
16	7 36 30.62	−0.246	+21 20 2.0	+0.76	15 51.9
17	7 36 24.50	0.265	21 20 20.8	0.81	15 47.9
18	7 36 17.91	0.284	21 20 40.7	0.85	15 43.8
19	7 36 10.86	0.303	21 21 1.6	0.89	15 39.7
20	7 36 3.36	0.322	21 21 23.6	0.94	15 35.7
21	7 35 55.40	−0.341	+21 21 46.6	+0.98	15 31.6
22	7 35 47.00	0.359	21 22 10.7	1.02	15 27.6
23	7 35 38.15	0.378	21 22 35.8	1.07	15 23.5
24	7 35 28.86	0.396	21 23 1.9	1.11	15 19.4
25	7 35 19.14	0.414	21 23 29.0	1.15	15 15.3
26	7 35 8.98	−0.432	+21 23 57.1	+1.19	15 11.2
27	7 34 58.40	0.450	21 24 26.2	1.23	15 7.2
28	7 34 47.39	0.467	21 24 56.2	1.27	15 3.0
29	7 34 35.97	0.484	21 25 27.1	1.31	14 58.9
30	7 34 24.14	0.501	21 25 58.9	1.34	14 54.7
31	7 34 11.91	−0.518	+21 26 31.6	+1.38	14 50.6
32	7 33 59.28	−0.534	+21 27 5.2	+1.42	14 46.4

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	7 34 11.91	−0.518	+21 26 31.6	+1.38	14 50.6
2	7 33 59.28	0.534	21 27 5.2	1.42	14 46.4
3	7 33 46.26	0.550	21 27 39.6	1.45	14 42.3
4	7 33 32.86	0.566	21 28 14.8	1.48	14 38.1
5	7 33 19.09	0.582	21 28 50.8	1.52	14 33.9
6	7 33 4.95	−0.597	+21 29 27.7	+1.55	14 29.8
7	7 32 50.44	0.612	21 30 5.3	1.58	14 25.6
8	7 32 35.59	0.626	21 30 43.6	1.61	14 21.4
9	7 32 20.39	0.640	21 31 22.7	1.64	14 17.2
10	7 32 4.85	0.655	21 32 2.4	1.67	14 13.0
11	7 31 48.98	−0.668	+21 32 42.8	+1.70	14 8.8
12	7 31 32.79	0.681	21 33 23.9	1.72	14 4.6
13	7 31 16.29	0.694	21 34 5.6	1.75	14 0.4
14	7 30 59.47	0.707	21 34 47.9	1.77	13 56.2
15	7 30 42.36	0.719	21 35 30.7	1.80	13 52.0
16	7 30 24.97	−0.731	+21 36 14.1	+1.82	13 47.8
17	7 30 7.29	0.742	21 36 58.0	1.84	13 43.5
18	7 29 49.34	0.753	21 37 42.5	1.86	13 39.3
19	7 29 31.13	0.764	21 38 27.3	1.88	13 35.1
20	7 29 12.67	0.774	21 39 12.6	1.90	13 30.9
21	7 28 53.97	−0.784	+21 39 58.4	+1.92	13 26.6
22	7 28 35.04	0.793	21 40 44.5	1.93	13 22.3
23	7 28 15.88	0.802	21 41 31.0	1.94	13 18.1
24	7 27 56.52	0.811	21 42 17.8	1.96	13 13.9
25	7 27 36.96	0.819	21 43 4.9	1.97	13 9.6
26	7 27 17.22	−0.826	+21 43 52.3	+1.98	13 5.3
27	7 26 57.30	0.833	21 44 39.8	1.99	13 1.1
28	7 26 37.23	0.840	21 45 27.6	2.00	12 56.8
29	7 26 17.00	0.846	21 46 15.6	2.00	12 52.5
30	7 25 56.63	0.851	21 47 3.8	2.01	12 48.3
31	7 25 36.14	−0.856	+21 47 52.0	+2.01	12 44.0
32	7 25 15.54	−0.860	+21 48 40.4	+2.02	12 39.7

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	9″.0	9″.1	9″.3	9″.4
Horizontal Parallax . .	1.0	1.0	1.1	1.1

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	9″.4	9″.5	9″.6	9″.7
Horizontal Parallax . .	1.1	1.1	1.1	1.1

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.	Date.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
Jan. 3	12 29 22.30	+1.809	−2 23 1.8	− 9.20	17 34.4	July 2	12 15 0.93	+4.090	−0 51 29.0	−29.30	5 32.3
7	12 29 27.86	0.968	2 23 27.8	− 3.82	17 18.7	6	12 15 18.79	4.837	0 53 35.8	34.10	5 16.9
11	12 29 30.05	+0.131	2 23 32.3	+ 1.56	17 3.0	10	12 15 39.60	5.563	0 56 1.6	38.75	5 1.5
15	12 29 28.91	−0.698	2 23 15.4	6.87	16 47.3	14	12 16 3.27	6.267	0 58 45.7	43.26	4 46.2
19	12 29 24.48	1.514	2 22 37.5	12.10	16 31.5	18	12 16 29.71	6.951	1 1 47.5	47.63	4 30.9
23	12 29 16.82	−2.317	−2 21 38.9	+17.19	16 15.6	22	12 16 58.85	+7.614	−1 5 6.5	−51.84	4 15.7
27	12 29 5.97	3.103	2 20 20.1	22.18	15 59.7	26	12 17 30.60	8.255	1 8 42.0	55.90	4 0.5
31	12 28 52.02	3.868	2 18 41.7	27.01	15 43.7	30	12 18 4.86	8.872	1 12 33.4	59.78	3 45.3
Feb. 4	12 28 35.06	4.607	2 16 44.3	31.65	15 27.7	Aug. 3	12 18 41.53	9.458	1 16 40.0	63.46	3 30.2
8	12 28 15.22	5.304	2 14 28.8	36.01	15 11.6	7	12 19 20.48	10.010	1 21 0.9	66.92	3 15.1
12	12 27 52.68	−5.958	−2 11 56.3	+40.16	14 55.5	11	12 20 1.57	10.529	−1 25 35.1	−70.14	3 0.1
16	12 27 27.61	6.571	2 9 7.9	43.96	14 39.4	15	12 20 44.68	11.014	1 30 21.7	73.15	2 45.1
20	12 27 0.18	7.136	2 6 5.0	47.46	14 23.2	19	12 21 29.65	11.467	1 35 20.0	75.94	2 30.1
24	12 26 30.59	7.651	2 2 48.7	50.63	14 7.0	23	12 22 16.37	11.891	1 40 29.0	78.51	2 15.1
28	12 25 59.04	8.113	1 59 20.4	53.45	13 50.7	27	12 23 4.72	12.277	1 45 47.7	80.84	2 0.2
Mar. 4	12 25 25.76	−8.518	−1 55 41.6	+55.89	13 34.4	31	12 23 54.54	12.624	−1 51 15.3	−82.91	1 45.3
8	12 24 50.99	8.857	1 51 53.8	57.91	13 18.1	Sept. 4	12 24 45.67	12.931	1 56 50.7	84.72	1 30.4
12	12 24 14.99	9.127	1 47 58.9	59.48	13 1.8	8	12 25 37.93	13.195	2 2 32.7	86.24	1 15.6
16	12 23 38.06	9.331	1 43 58.6	60.62	12 45.5	12	12 26 31.17	13.418	2 8 20.3	87.50	1 0.7
20	12 23 0.43	9.470	1 39 54.5	61.33	12 29.1	16	12 27 25.23	13.606	2 14 12.4	88.51	0 45.9
24	12 22 22.38	−9.545	−1 35 48.5	+61.63	12 12.7	20	12 28 19.97	13.756	−2 20 8.0	−89.26	0 31.0
28	12 21 44.16	9.555	1 31 42.1	61.48	11 56.4	24	12 29 15.22	13.862	2 26 6.1	89.74	0 16.2
Apr. 1	12 21 6.03	9.495	1 27 37.2	60.92	11 40.0	28	12 30 10.82	13.927	2 32 5.6	89.94	0 1.4
5	12 20 28.28	9.368	1 23 35.3	59.93	11 23.7	Oct. 2	12 31 6.57	13.943	2 38 5.3	89.84	23 42.9
9	12 19 51.18	9.171	1 19 38.4	58.45	11 7.3	6	12 32 2.30	13.913	2 44 3.9	89.44	23 28.1
13	12 19 15.01	−8.907	−1 15 48.2	+56.58	10 51.0	10	12 32 57.82	13.842	−2 50 0.5	−88.77	23 13.3
17	12 18 40.00	8.589	1 12 6.2	54.36	10 34.7	14	12 33 52.98	13.730	2 55 53.8	87.83	22 58.5
21	12 18 6.37	8.216	1 8 33.8	51.78	10 18.4	18	12 34 47.61	13.576	3 1 42.7	86.62	22 43.7
25	12 17 34.34	7.791	1 5 12.6	48.83	10 2.2	22	12 35 41.53	13.378	3 7 26.4	85.15	22 28.8
29	12 17 4.12	7.311	1 2 3.8	45.56	9 46.0	26	12 36 34.57	13.135	3 13 3.5	83.37	22 14.0
May 3	12 16 35.92	−6.780	−0 59 8.6	+41.98	9 29.8	30	12 37 26.55	12.843	−3 18 33.0	−81.30	21 59.1
7	12 16 9.94	6.202	0 56 28.3	38.10	9 13.6	Nov. 3	12 38 17.26	12.505	3 23 53.6	78.95	21 44.2
11	12 15 46.36	5.586	0 54 4.1	33.98	8 57.5	7	12 39 6.54	12.128	3 29 4.3	76.34	21 29.3
15	12 15 25.31	4.936	0 51 56.7	29.66	8 41.4	11	12 39 54.23	11.710	3 34 4.0	73.48	21 14.4
19	12 15 6.91	4.260	0 50 7.0	25.17	8 25.4	15	12 40 40.17	11.254	3 38 51.8	70.38	20 59.4
23	12 14 51.26	−3.558	−0 48 35.6	+20.51	8 9.4	19	12 41 24.21	10.757	−3 43 26.8	−67.04	20 44.4
27	12 14 38.48	2.831	0 47 23.1	15.73	7 53.5	23	12 42 6.17	10.216	3 47 47.9	63.44	20 29.4
31	12 14 28.64	2.082	0 46 29.9	10.83	7 37.6	27	12 42 45.89	10.635	3 51 54.0	59.59	20 14.3
June 4	12 14 21.84	1.317	0 45 56.7	5.80	7 21.8	Dec. 1	12 43 23.20	9.015	3 55 44.3	55.52	19 59.2
8	12 14 18.12	−0.541	0 45 43.6	+ 0.73	7 6.0	5	12 43 57.96	8.362	3 59 17.8	51.24	19 44.0
12	12 14 17.51	+0.236	−0 45 50.8	− 4.34	6 50.2	9	12 44 30.06	+7.680	−4 2 33.9	−46.81	19 28.8
16	12 14 20.01	1.013	0 46 18.3	9.40	6 34.5	13	12 44 59.37	6.971	4 5 31.9	42.18	19 13.5
20	12 14 25.61	1.788	0 47 6.0	14.44	6 18.9	17	12 45 25.79	6.234	4 8 11.2	37.41	18 58.2
24	12 14 34.31	2.561	0 48 13.8	19.44	6 3.4	21	12 45 49.20	5.469	4 10 31.1	32.49	18 42.9
28	12 14 46.09	3.329	0 49 41.5	24.41	5 47.8	25	12 46 9.51	4.678	4 12 31.0	27.43	18 27.5
July 2	12 15 0.93	+4.090	−0 51 29.0	−29.30	5 32.3	29	12 46 26.61	+3.869	−4 14 10.4	−22.26	18 12.0
6	12 15 18.79	+4.837	−0 53 35.8	−34.10	5 16.9	33	12 46 40.44	+3.047	−4 15 29.0	−17.03	17 56.5

Greatest horizontal parallax,	March 26, 0″.51.	Greatest semidiameter,	March 26, 1″.98.
Least horizontal parallax,	September 30, 0″.46.	Least semidiameter,	September 30, 1″.78.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.	Date.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
Jan. 3	3 24 20.25	−3.913	+16 49 37.1	−11.34	8 30.8	July 2	3 40 4.15	+7.163	+17 50 33.2	+21.83	20 54.9
7	3 24 5.54	3.439	16 48 55.5	9.46	8 14.8	6	3 40 32.11	6.811	17 51 57.8	20.43	20 39.7
11	3 23 52.77	2.943	16 48 21.6	7.47	7 58.9	10	3 40 58.61	6.436	17 53 16.5	18.96	20 24.4
15	3 23 42.02	2.430	16 47 55.8	5.44	7 43.0	14	3 41 23.57	6.041	17 54 29.2	17.42	20 9.1
19	3 23 33.35	1.902	16 47 38.1	3.38	7 27.1	18	3 41 46.91	5.626	17 55 35.8	15.86	19 53.7
23	3 23 26.81	−1.364	+16 47 28.8	− 1.29	7 11.3	22	3 42 8.55	+5.190	+17 56 36.0	+14.26	19 38.3
27	3 23 22.45	0.813	16 47 27.8	+ 0.81	6 55.5	26	3 42 28.39	4.733	17 57 29.8	12.61	19 22.9
31	3 23 20.31	−0.254	16 47 35.3	2.94	6 39.7	30	3 42 46.37	4.256	17 58 16.8	10.89	19 7.5
Feb. 4	3 23 20.42	+0.310	16 47 51.3	5.07	6 24.0	Aug. 3	3 43 2.41	3.764	17 58 56.9	9.15	18 52.0
8	3 23 22.79	0.876	16 48 15.9	7.19	6 8.3	7	3 43 16.46	3.259	17 59 30.0	7.39	18 36.5
12	3 23 27.42	+1.436	+16 48 48.8	9.26	5 52.7	11	3 43 28.45	+2.739	+17 59 56.0	+ 5.63	18 21.0
16	3 23 34.27	1.990	16 49 30.0	+11.30	5 37.1	15	3 43 38.36	2.214	18 0 15.0	3.87	18 5.4
20	3 23 43.33	2.536	16 50 19.2	13.29	5 21.5	19	3 43 46.15	1.680	18 0 27.0	2.10	17 49.8
24	3 23 54.56	3.074	16 51 16.2	15.20	5 6.0	23	3 43 51.79	1.136	18 0 31.8	+ 0.30	17 34.2
28	3 24 7.91	3.602	16 52 20.7	17.05	4 50.4	27	3 43 55.24	0.590	18 0 29.4	− 1.48	17 18.5
Mar. 4	3 24 23.36	+4.116	+16 53 32.5	+18.82	4 35.0	31	3 43 56.51	+0.045	+18 0 20.0	− 3.24	17 2.8
8	3 24 40.82	4.611	16 54 51.2	20.54	4 19.5	Sept. 4	3 43 55.60	−0.501	18 0 3.5	5.00	16 47.0
12	3 25 0.22	5.088	16 56 16.7	22.16	4 4.1	8	3 43 52.52	1.043	17 59 40.1	6.69	16 31.2
16	3 25 21.49	5.542	16 57 48.3	23.64	3 48.7	12	3 43 47.28	1.574	17 59 10.0	8.36	16 15.4
20	3 25 44.53	5.975	16 59 25.7	25.04	3 33.4	16	3 43 39.94	2.096	17 58 33.3	9.96	15 59.6
24	3 26 9.26	+6.387	+17 1 8.5	+26.34	3 18.1	20	3 43 30.53	−2.606	+17 57 50.3	−11.54	15 43.7
28	3 26 35.59	6.772	17 2 56.2	27.49	3 2.8	24	3 43 19.11	3.102	17 57 1.0	13.08	15 27.8
Apr. 1	3 27 3.40	7.132	17 4 48.3	28.54	2 47.5	28	3 43 5.74	3.580	17 56 5.8	14.51	15 11.8
5	3 27 32.61	7.467	17 6 44.4	29.51	2 32.3	Oct. 2	3 42 50.50	4.038	17 55 5.0	15.87	14 55.8
9	3 28 3.10	7.774	17 8 44.2	30.35	2 17.1	6	3 42 33.47	4.468	17 53 58.9	17.15	14 39.8
13	3 28 34.76	+8.050	+17 10 47.0	+31.03	2 1.9	10	3 42 14.79	−4.870	+17 52 47.9	−18.34	14 23.8
17	3 29 7.46	8.295	17 12 52.3	31.61	1 46.7	14	3 41 54.55	5.244	17 51 32.4	19.38	14 7.7
21	3 29 41.08	8.510	17 14 59.8	32.09	1 31.5	18	3 41 32.88	5.588	17 50 13.0	20.34	13 51.6
25	3 30 15.50	8.696	17 17 8.8	32.42	1 16.4	22	3 41 9.89	5.897	17 48 49.8	21.21	13 35.5
29	3 30 50.61	8.852	17 19 18.9	32.65	1 1.2	26	3 40 45.75	6.170	17 47 23.5	21.94	13 19.4
May 3	3 31 26.28	+8.979	+17 21 29.8	+32.76	0 46.1	30	3 40 20.58	−6.404	+17 45 54.5	−22.53	13 3.2
7	3 32 2.40	9.073	17 23 40.8	32.74	0 30.9	Nov. 3	3 39 54.57	6.596	17 44 23.5	22.95	12 47.1
11	3 32 38.82	9.133	17 25 51.5	32.61	0 15.8	7	3 39 27.87	6.743	17 42 51.1	23.23	12 30.9
15	3 33 15.42	9.161	17 28 1.5	32.35	0 0.7 23 56.9	11	3 39 0.68	6.850	17 41 17.8	23.41	12 14.7
19	3 33 52.07	9.160	17 30 10.2	32.00	23 41.8	15	3 38 33.13	6.914	17 39 44.0	23.43	11 58.5
23	3 34 28.66	+9.129	+17 32 17.4	+31.56	23 26.7	19	3 38 5.43	−6.931	+17 38 10.6	−23.26	11 42.3
27	3 35 5.06	9.068	17 34 22.5	30.99	23 11.6	23	3 37 37.74	6.906	17 36 38.1	22.96	11 26.2
31	3 35 41.16	8.977	17 36 25.2	30.33	22 56.4	27	3 37 10.24	6.835	17 35 7.1	22.51	11 10.0
June 4	3 36 16.83	8.850	17 38 25.0	29.55	22 41.3	Dec. 1	3 36 43.12	6.717	17 33 38.2	21.90	10 53.8
8	3 36 51.92	8.691	17 40 21.5	28.70	22 26.1	5	3 36 16.56	6.555	17 32 12.1	21.14	10 37.6
12	3 37 26.32	+8.505	+17 42 14.5	+27.75	22 11.0	9	3 35 50.74	−6.349	+17 30 49.3	−20.24	10 21.5
16	3 37 59.92	8.291	17 44 3.4	26.71	21 55.8	13	3 35 25.82	6.104	17 29 30.4	19.20	10 5.3
20	3 38 32.61	8.051	17 45 48.1	25.61	21 40.6	17	3 35 1.96	5.821	17 28 15.9	18.01	9 49.2
24	3 39 4.29	7.783	17 47 28.2	24.43	21 25.4	21	3 34 39.30	5.500	17 27 6.4	16.70	9 33.1
28	3 39 34.84	7.487	17 49 3.4	23.15	21 10.2	25	3 34 18.01	5.141	17 26 2.4	15.30	9 17.1
July 2	3 40 4.15	+7.163	+17 50 33.2	+21.83	20 54.9	29	3 33 58.22	−4.747	+17 25 4.2	−13.76	9 1.0
6	3 40 32.11	+6.811	+17 51 57.8	+20.43	20 39.7	33	3 33 40.08	−4.390	+17 24 12.5	−12.06	8 45.0

Greatest horizontal parallax,	November 18, 0″.31.	Greatest semidiameter,	November 18, 1″.33.
Least horizontal parallax,	May 17, 0″.29.	Least semidiameter,	May 17, 1″.25.

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 1	161 8 8.2	4 32 13.3	− 9 35.4	+6 23 41.7	−13 31.0	9.5618155	9.9358524	9.9463362
3	169 55 18.2	4 15 11.9	11 43.8	5 53 7.7	16 52.1	9.5754255	9.9565510	9.9664603
5	178 10 1.4	3 59 48.2	12 45.0	5 16 52.7	19 14.1	9.5884902	9.9760406	9.9852766
7	185 55 40.1	3 46 7.7	12 45.2	4 36 42.9	20 48.8	9.6008020	9.9941615	0.0026933
9	193 15 40.1	3 34 9.0	11 54.1	3 54 2.0	21 46.8	9.6122219	0.0108749	0.0187118
11	200 13 20.2	3 23 46.5	−10 22.3	+3 9 54.3	−22 16.9	9.6226605	0.0262115	0.0333838
13	206 51 45.5	3 14 53.2	8 20.1	2 25 8.0	22 26.4	9.6320654	0.0402387	0.0467874
15	213 13 47.9	3 7 22.0	5 57.7	1 40 19.1	22 20.2	9.6404085	0.0530409	0.0590102
17	219 22 3.8	3 1 5.5	3 23.5	0 55 54.7	22 2.5	9.6476783	0.0647062	0.0701396
19	225 18 55.4	2 55 57.2	− 0 44.8	+0 12 14.6	21 36.2	9.6538738	0.0753209	0.0802597
21	231 6 34.4	2 51 51.7	+ 1 51.6	−0 30 25.9	−21 3.2	9.6589996	0.0849651	0.0894460
23	236 47 0.8	2 48 44.1	4 20.2	1 11 54.8	20 24.9	9.6630629	0.0937106	0.0977667
25	242 22 7.0	2 46 31.0	6 36.5	1 52 2.4	19 42.0	9.6660716	0.1016214	0.1052815
27	247 53 39.3	2 45 9.6	8 36.6	2 30 40.0	18 54.8	9.6680330	0.1087529	0.1120412
29	253 23 18.6	2 44 38.1	10 16.8	3 7 39.0	18 3.2	9.6689516	0.1151510	0.1180886
31	258 52 44.6	2 44 55.9	+11 34.1	−3 42 51.0	−17 7.6	9.6688300	0.1208563	0.1234583
Feb. 2	264 23 34.8	2 46 2.4	12 26.0	4 16 6 1	16 6.6	9.6676677	0.1258978	0.1281774
4	269 57 27.4	2 47 58.6	12 50.5	4 47 13.2	14 59.5	9.6654620	0.1302992	0.1322647
6	275 36 3.1	2 50 45.8	12 45.7	5 15 58.9	13 44.9	9.6622071	0.1340753	0.1357317
8	281 21 6.3	2 54 26.6	12 10.5	5 42 6.9	12 21.5	9.6578962	0.1372339	0.1385814
10	287 14 27.4	2 59 4.0	+11 4.0	−6 5 17.6	−10 47.2	9.6525208	0.1397730	0.1408073
12	293 18 2.6	3 4 41 8	9 26.6	6 25 7.1	8 59.8	9.6460745	0.1416820	0.1423938
14	299 33 57.5	3 11 24.6	7 19.7	6 41 6.2	6 56.4	9.6385537	0.1429390	0.1433134
16	306 4 27.7	3 19 17.7	4 45.9	6 52 40.0	4 33.9	9.6299612	0.1435115	0.1435267
18	312 51 59.0	3 28 26.7	+ 1 50.0	6 59 6.5	− 1 48.5	9.6203115	0.1433521	0.1429799
20	319 59 9.0	3 38 57.4	− 1 20.6	−6 59 36.3	+ 1 23.4	9.6096384	0.1424003	0.1416027
22	327 28 46.1	3 50 54.4	4 35.8	6 53 12.5	5 5.7	9.5980007	0.1405756	0.1393062
24	335 23 46.4	4 4 20.9	7 41.6	6 38 51.2	9 21.4	9.5854986	0.1377800	0.1359815
26	343 47 9.3	4 19 16.1	10 20.5	6 15 24.0	14 11.5	9.5722858	0.1338933	0.1314969
28	352 41 48.3	4 35 35.5	12 11.2	5 41 43.2	19 34.1	9.5585878	0.1287721	0.1256979
Mar. 2	2 10 17.3	4 53 3.0	−12 52.2	−4 56 51.0	+25 18.5	9.5447226	0.1222517	0.1184097
4	12 14 28.2	5 11 11.9	12 4.1	4 0 13.8	31 12.4	9.5311154	0.1141475	0.1094411
6	22 55 4.0	5 29 19.2	9 36.5	2 52 1.3	36 50.7	9.5183064	0.1042667	0.0985995
8	34 11 4.0	5 46 24.6	5 34.7	1 33 29.4	41 27.9	9.5069353	0.0924177	0.0857021
10	45 59 10.7	6 1 12.3	− 0 26.8	−0 7 18.7	44 21.7	9.4976949	0.0784363	0.0706082
12	58 13 25.0	6 12 18.0	+ 4 56.4	+1 22 19.9	+44 49.6	9.4912468	0.0622118	0.0532464
14	70 45 3.2	6 18 25.3	9 31.3	2 50 5.1	42 26.0	9.4881122	0.0437175	0.0336396
16	83 23 12.4	6 18 42.8	12 18.5	4 10 11.7	37 14.5	9.4885623	0.0230338	0.0119291
18	95 55 54.3	6 13 0.9	12 44.5	5 17 34.1	29 50.0	9.4925572	0.0003626	9.9883778
20	108 11 40.0	6 1 55.9	10 50.6	6 8 41.1	21 9.8	9.4997554	9.9760253	9.9633622
22	120 0 50.1	5 46 39.6	+ 7 9.8	+6 42 3.8	+12 15.5	9.5095909	9.9504508	9.9373581
24	431 16 31.2	5 28 42.5	+ 2 32.2	6 58 7.2	+ 3 57.3	9.5213838	9.9241562	9.9109216
26	141 54 51.0	5 9 31.4	− 2 12.4	6 58 38.2	− 3 13.4	9.5344481	9.8977338	9.8846769
28	151 54 36.3	4 50 19.0	6 23.3	6 46 7.6	9 3.6	9.5481660	9.8718370	9.8593036
30	161 16 41.1	4 31 57.2	9 37.9	6 23 16.7	13 34.6	9.5620252	9.8471677	9.8355209
32	170 3 19.7	4 14 56.9	−11 45.3	+5 52 36.5	−16 54.8	9.5756288	9.8244548	9.8140595
34	178 17 34.4	3 59 34.8	−12 45.4	+5 16 17.1	−19 15.9	9.5886832	9.8044203	9.7956168

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Apr. 1	170 3 19.7	4 14 56.9	−11 45.3	+5 52 36.5	−16 54.8	9.5756288	9.8244548	9.8140595
3	178 17 34.4	3 59 34.8	12 45.4	5 16 17.1	19 15.9	9.5886832	9.8044203	9.7956168
5	186 2 47.8	3 45 55.9	12 44.7	4 36 4.4	20 49.9	9.6009821	9.7877234	9.7807998
7	193 22 26.0	3 33 58.7	11 52.9	3 53 21.8	21 47.5	9.6123875	9.7748969	9.7700510
9	200 19 46.7	3 23 37.5	10 20.5	3 9 13.1	22 17.3	9.6228106	9.7662823	9.7635969
11	206 57 55.7	3 14 45.8	− 8 18.0	+2 24 26.5	−22 26.4	9.6321995	9.7619845	9.7614200
13	213 19 44.5	3 7 15.8	5 55.4	1 39 37.9	22 20.0	9.6405261	9.7618653	9.7632714
15	219 27 48.8	3 1 0.4	3 21.0	0 55 14.0	22 2.3	9.6477794	9.7655791	9.7687232
17	225 24 31.4	2 55 53.1	− 0 42.4	+0 11 34.6	21 35.8	9.6539586	9.7726336	9.7772379
19	231 12 2.9	2 51 48.4	+ 1 53.8	−0 31 4.8	21 2.7	9.6590682	9.7824634	9.7882396
21	236 52 23.6	2 48 41.6	+ 4 22.4	−1 12 32.6	−20 24.3	9.6631153	9.7944982	9.8011744
23	242 27 25.8	2 46 29.4	6 38.5	1 52 38.9	19 41.3	9.6661082	9.8082078	9.8155439
25	247 58 55.6	2 45 8.7	8 38.1	2 31 15.0	18 54.1	9.6680537	9.8231324	9.8309278
27	253 28 34.0	2 44 38.0	10 18.2	3 8 12.5	18 2.7	9.6689566	9.8388898	9.8469827
29	258 58 0.5	2 44 56.5	11 35.2	3 43 22.7	17 6.7	9.6688194	9.8551750	9.8634391
May 1	264 28 52.6	2 46 3.6	+12 26.6	−4 16 35.9	−16 5.6	9.6676417	9.8717511	9.8800907
3	270 2 48.4	2 48 0.6	12 50.7	4 47 40.9	14 58.4	9.6654203	9.8884399	9.8967832
5	275 41 29.3	2 50 48.8	12 45.4	5 16 24.3	13 43.7	9.6621499	9.9051073	9.9134010
7	281 26 39.1	2 54 30.2	12 9.6	5 42 29.7	12 20.1	9.6578233	9.9216542	9.9298584
9	287 20 8.1	2 59 8.5	11 2.7	6 5 37.5	10 45.7	9.6524320	9.9380065	9.9460918
11	293 23 53.4	3 4 47.2	+ 9 24.8	−6 25 23.7	− 8 58.0	9.6459699	9.9541081	9.9620500
13	299 40 0.3	3 11 30.9	7 17.4	6 41 19.0	6 54 4	9.6384331	9.9699124	9.9776899
15	306 10 44.0	3 19 25.2	4 43.4	6 52 48.4	4 31.5	9.6298247	9.9853773	9.9929695
17	312 58 31.6	3 28 35.4	+ 1 47.2	6 59 9.8	− 1 45.8	9.6201595	0.0004610	0.0078461
19	320 6 0.1	3 39 7.1	− 1 23.6	6 59 33.8	+ 1 26.6	9.6094713	0.0151184	0.0222701
21	327 35 57.9	3 51 5.5	− 4 38.7	−6 53 3.2	+ 5 9.4	9.5978200	0.0292931	0.0361792
23	335 31 21.8	4 4 33.4	7 44.2	6 38 34.1	9 25.5	9.5853064	0.0429183	0.0494994
25	343 55 10.9	4 19 30.2	10 22.6	6 14 58.1	14 16.2	9.5720845	0.0559104	0.0621379
27	352 50 18.5	4 35 50.4	12 12.4	5 41 7.6	19 39.2	9.5583813	0.0681663	0.0739798
29	2 19 18.2	4 53 18.8	12 52.2	4 56 5.1	25 26.3	9.5445164	0.0795607	0.0848897
31	12 24 1.1	5 11 28.0	−12 2.6	−3 59 17.3	+31 20.9	9.5309168	0.0899461	0.0947083
June 2	23 5 8.8	5 29 34.9	9 33.5	2 50 54.8	36 55.4	9.5181245	0.0991537	0.1032590
4	34 21 38.9	5 46 38.9	5 30.5	1 32 14.6	41 31.4	9.5067802	0.1070012	0.1103576
6	46 10 11.6	6 1 23.8	− 0 21.9	−0 5 58.8	44 23.5	9.4975767	0.1133066	0.1158276
8	58 24 45.3	6 12 25.8	+ 5 1.1	+1 23 40.6	44 48.8	9.4911750	0.1179044	0.1195222
10	70 56 34.4	6 18 28.1	+ 9 34.7	+2 51 21.4	+42 22.6	9.4880928	0.1206712	0.1213451
12	83 34 43.8	6 18 40.6	12 20.0	4 11 18.7	37 8.7	9.4885969	0.1215432	0.1212686
14	96 7 16.2	6 12 53.4	12 43.7	5 18 27.7	29 42.6	9.4926430	0.1205290	0.1193364
16	108 22 42.0	6 1 44.1	10 48.0	6 9 19.1	21 1.7	9.4998854	0.1177067	0.1156578
18	120 11 25.7	5 46 25.0	7 5.5	6 42 25.8	12 7.6	9.5097552	0.1132109	0.1103878
20	131 26 35.0	5 28 25.7	+ 2 27.8	+6 58 14.2	+ 3 50.3	9.5215717	0.1072117	0.1037058
22	142 4 20.6	5 9 14.4	− 2 16.0	6 58 32.3	− 3 19.2	9.5346499	0.0998932	0.0957959
24	152 3 32.7	4 50 2.7	6 26.7	6 45 51.1	9 8.4	9.5483732	0.0914349	0.0868301
26	161 25 5.5	4 31 41.6	9 40.4	6 22 51.9	13 38.1	9.5622312	0.0819997	0.0769611
28	170 11 14.1	4 14 42.6	11 46.6	5 52 5.7	16 57.3	9.5758283	0.0717295	0.0663188
30	178 25 1.8	3 59 22.1	−12 45.7	+5 15 41.9	−19 17.7	9.5888725	0.0607416	0.0550093
32	186 9 51.4	3 45 44.7	−12 44.3	+4 35 26.2	−20 51.1	9.6011589	0.0491320	0.0431181

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 2	186 9 51.4	3 45 44.7	−12 44.3	+4 35 26.2	−20 51.1	9.6011589	0.0491320	0.0431181
4	193 29 8.3	3 33 46.8	11 51.9	3 52 41.8	21 48.1	9.6125501	0.0369757	0.0307116
6	200 26 10.7	3 23 29.1	10 19.0	3 8 32.2	22 17.6	9.6229580	0.0243316	0.0178413
8	207 4 4.2	3 14 38.7	8 15.9	2 23 45.2	22 26.5	9.6323311	0.0112450	0.0045468
10	213 25 39.7	3 7 9.8	5 53.0	1 38 56.5	22 19.9	9.6406419	9.9977506	9.9908600
12	219 33 33.0	3 0 55.3	− 3 18.6	+0 54 33.2	−22 1.9	9.6478796	9.9838783	9.9768080
14	225 30 6.4	2 55 49.0	− 0 40.0	+0 10 54.7	21 36.4	9.6540428	9.9696521	9.9624140
16	231 17 30.7	2 51 45.2	+ 1 56.1	−0 31 43.8	21 2.2	9.6591366	9.9550971	9.9477050
18	236 57 45.8	2 48 39.3	4 24.6	1 13 10.4	20 23.4	9.6631682	9.9402419	9.9327128
20	242 32 44.1	2 46 27.8	6 40.5	1 53 15.3	19 40.4	9.6661455	9.9251236	9.9174811
22	248 4 11.4	2 45 7.7	+ 8 40.0	−2 31 50.0	−18 53.3	9.6680754	9.9097933	9.9020702
24	253 33 49.1	2 44 38.0	10 19.6	3 8 45.9	18 1.8	9.6689628	9.8943235	9.8865666
26	259 3 16.3	2 44 57.3	11 36.1	3 43 54.4	17 5.9	9.6688103	9.8788155	9.8710899
28	264 34 10.7	2 46 5.2	12 27.2	4 17 5.8	16 4.6	9.6676167	9.8634115	9.8558070
30	270 8 10.2	2 48 2.7	12 50.8	4 48 8.7	14 57.2	9.6653796	9.8483069	9.8409459
Aug. 1	275 46 55.8	2 50 51.6	+12 45.2	−5 16 49.7	−13 42.5	9.6620934	9.8337639	9.8268065
3	281 32 12.2	2 54 34.0	12 9.0	5 42 52.6	12 18.8	9.6577506	9.8201250	9.8137753
5	287 25 49.6	2 59 13.2	11 1.5	6 5 57.5	10 44.2	9.6523432	9.8078208	9.8023292
7	293 29 45.2	3 4 52.8	9 23.1	6 25 40.3	8 56.2	9.6458646	9.7973738	9.7930306
9	299 46 4.4	3 11 37.6	7 15.3	6 41 31.8	6 52.3	9.6383114	9.7893794	9.7864997
11	306 17 2.7	3 19 32.9	+ 4 40.7	−6 52 56.7	− 4 29.1	9.6296867	9.7844691	9.7833618
13	313 5 6.8	3 28 44.3	+ 1 44.3	6 59 13.0	− 1 43.0	9.6200057	9.7832442	9.7841733
15	320 12 54.4	3 39 17.4	− 1 26.6	6 59 31.1	+ 1 29.8	9.6093022	9.7861927	9.7893311
17	327 43 14.3	3 51 17.1	4 41.7	6 52 53.7	5 13.0	9.5976370	9.7935996	9.7989924
19	335 39 2.6	4 4 46.4	7 46.9	6 38 16.7	9 29.7	9.5851108	9.8054836	9.8130304
21	344 3 19.5	4 19 44.7	−10 24.8	−6 14 31.8	+14 20.9	9.5718794	9.8215733	9.8310376
23	352 58 57.0	4 36 5.9	12 13.6	5 40 31.4	19 44.4	9.5581709	9.8413383	9.8523794
25	2 28 28.7	4 53 35.1	12 52.1	4 55 18.2	25 31.7	9.5443062	9.8640597	9.8762728
27	12 33 44.7	5 11 44.8	12 1.0	3 58 19.5	31 26.2	9.5307143	9.8889106	9.9018662
29	23 15 25.8	5 29 51.2	9 30.6	2 49 46.8	37 0.2	9.5179385	9.9150338	9.9283113
31	34 32 26.8	5 46 53.6	− 5 26.0	−1 30 58.2	+41 34.8	9.5066210	9.9416010	9.9548106
Sept. 2	46 21 26.8	6 1 36.1	− 0 16.8	−0 4 37.3	44 24.9	9.4974550	9.9678529	9.9806491
4	58 36 21.1	6 12 33.9	+ 5 5.8	+1 25 3.1	44 48.0	9.4911006	9.9931273	0.0052241
6	71 8 21.5	6 18 31.1	9 38.2	2 52 39.4	42 18.9	9.4880718	0.0168846	0.0280633
8	83 46 31.3	6 18 37.9	12 21.4	4 12 27.0	37 2.7	9.4886311	0.0387247	0.0488416
10	96 18 53.2	6 12 45.7	+12 42.9	+5 19 22.3	+29 35.0	9.4927292	0.0583964	0.0673801
12	108 33 59.1	6 1 31.8	10 45.2	6 9 57.8	20 53.5	9.5000164	0.0757905	0.0836331
14	120 22 14.6	5 46 9.5	7 1.8	6 42 48.1	11 59.5	9.5099211	0.0909186	0.0976630
16	131 36 51.3	5 28 8.6	+ 2 23.4	6 58 21.2	+ 3 43.0	9.5217620	0.1038852	0.1096063
18	142 14 1.8	5 8 56.6	− 2 20.2	6 58 26.1	− 3 25.2	9.5348546	0.1148492	0.1196382
20	152 12 38.7	4 49 45.4	− 6 30.2	+6 45 34.1	− 9 13.1	9.5485837	0.1239977	0.1279511
22	161 33 37.8	4 31 25.2	9 42.9	6 22 26.7	13 41.7	9.5624405	0.1315215	0.1347312
24	170 19 15.1	4 14 27.7	11 48.0	5 51 34.3	16 59.9	9.5760315	0.1376012	0.1401513
26	178 32 34.7	3 59 8.8	12 46.3	5 15 6.2	19 19.4	9.5890660	0.1424001	0.1443644
28	186 16 59.2	3 45 32.8	12 44.1	4 34 47.7	20 52.2	9.6013399	0.1460597	0.1475001
30	193 35 53.9	3 33 38.5	−11 50.7	+3 52 1.5	−21 48.8	9.6127171	0.1486989	0.1496680
32	200 32 37.4	3 23 20.3	−10 17.2	+3 7 50.9	−22 17.8	9.6231099	0.1504174	0.1509573

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Oct. 2	200 32 37.4	3 23 20.3	−10 17.2	+3 7 50.9	−22 17.8	9.6231099	0.1504174	0.1509573
4	207 10 14.4	3 14 31.3	8 13.9	2 23 3.7	22 26.6	9.6324676	0.1512956	0.1514400
6	213 31 36.1	3 7 3.4	5 50.8	1 38 15.4	22 19.8	9.6407624	0.1513970	0.1511723
8	219 39 17.6	3 0 50.0	3 16.1	0 53 52.4	22 1.6	9.6479838	0.1507705	0.1501962
10	225 35 41.6	2 55 44.8	− 0 37.5	+0 10 14.8	21 34.8	9.6541312	0.1494527	0.1485423
12	231 22 58.4	2 51 41.9	+ 1 58.6	−0 32 22.6	−21 1.6	9.6592087	0.1474672	0.1462291
14	237 3 7.8	2 48 36.9	4 26.8	1 13 48.0	20 23.0	9.6632242	0.1448288	0.1432661
16	242 38 2.1	2 46 26.2	6 42.4	1 53 51.7	19 29.9	9.6661856	0.1415409	0.1396524
18	248 9 26.9	2 45 7.0	8 41.6	2 32 24.9	18 52.6	9.6680996	0.1375991	0.1353791
20	253 39 3.6	2 44 37.9	10 21.0	3 9 19.2	18 1.0	9.6689709	0.1329899	0.1304283
22	259 8 31.2	2 44 57.8	+11 37.3	−3 44 26.0	−17 4.9	9.6688023	0.1276910	0.1247739
24	264 39 27.4	2 46 6.6	12 27.9	4 17 35.4	16 3.6	9.6675925	0.1216725	0.1183818
26	270 13 30.7	2 48 5.0	12 51.0	4 48 36.3	14 56.1	9.6653391	0.1148960	0.1112093
28	275 52 21.5	2 50 54.6	12 44.8	5 17 15.0	13 41.2	9.6620364	0.1073145	0.1032043
30	281 37 44.8	2 54 37.9	12 8.0	5 43 15.3	12 17.4	9.6576770	0.0988713	0.0943068
Nov. 1	287 31 31.0	2 59 17.9	+11 0.1	−6 6 17.2	−10 43.6	9.6522527	0.0895019	0.0844471
3	293 35 36.7	3 4 58.4	9 21.3	6 25 56.7	8 54.5	9.6457572	0.0791324	0.0735469
5	299 52 8.1	3 11 44.4	7 13.1	6 41 44.4	6 50.3	9.6381870	0.0676797	0.0615191
7	306 23 21.2	3 19 40.9	4 38.2	6 53 5.0	4 26.8	9.6295453	0.0550532	0.0482702
9	313 11 42.4	3 28 53.5	+ 1 41.4	6 59 16.1	− 1 40.3	9.6198477	0.0411579	0.0337044
11	320 19 49.7	3 39 28.0	− 1 29.6	−6 59 28.3	+ 1 22.9	9.6091283	.0.0258986	0.0177301
13	327 50 32.0	3 51 29.0	4 44.6	6 52 44.0	5 16.7	9.5974483	0.0091905	0.0002743
15	335 46 45.6	4 4 59.7	7 49.6	6 37 59.1	9 33.9	9.5849098	9.9909785	9.9813054
17	344 11 30.3	4 19 59.4	10 26.8	6 14 5.2	14 25.7	9.5716687	9.9712639	9.9608715
19	353 7 38.6	4 36 21.8	12 14.8	5 39 54.8	19 49.9	9.5579548	9.9501555	9.9391582
21	2 37 43.1	4 53 51.9	−12 52.0	−4 54 30.8	+25 37.2	9.5440906	9.9279384	9.9165765
23	12 43 33.2	5 12 1.8	11 59.5	3 57 21.1	31 31.6	9.5305068	9.9051775	9.8938752
25	23 25 48.0	5 30 7.8	9 27.3	2 48 38.1	37 5.0	9.5177483	9.8828345	9.8722522
27	34 43 21.4	5 47 8.9	5 21.6	1 29 40.9	41 38.5	9.5064589	9.8623562	9.8533990
29	46 32 49.3	6 1 46.4	− 0 11.9	−0 3 14.6	44 26.5	9.4973316	9.8456461	9.8393600
Dec. 1	58 48 4.3	6 12 42.0	+ 5 10.5	+1 26 26.3	+44 46.9	9.4910251	9.8347796	9.8320959
3	71 20 16.1	6 18 34.3	9 41.6	2 53 58.1	42 15.4	9.4880505	9.8314324	9.8328281
5	83 58 26.9	6 18 35.5	12 22.8	4 13 35.9	36 56.6	9.4886658	9.8362360	9.8415229
7	96 30 38.1	6 12 37.7	12 42.1	5 20 17.3	29 27.4	9.4928167	9.8484879	9.8568855
9	108 45 23.4	6 1 19.3	10 42.3	6 10 36.6	20 45.2	9.5001492	9.8664465	9.8768984
11	120 33 10.2	5 45 53.6	+ 6 57.7	+6 43 10.4	+11 52.6	9.5100895	9.8879857	9.8994773
13	131 47 13.3	5 27 51.0	+ 2 19.0	6 58 28.0	+ 3 37.0	9.5219552	9.9111748	9.9229125
15	142 23 48.0	5 8 38.7	− 2 24.5	6 58 19.6	− 3 20.4	9.5350624	9.9345588	9.9460096
17	152 21 49.2	4 49 27.7	6 33.6	6 45 16.9	9 17.4	9.5487975	9.9571876	9.9680367
19	161 42 13.9	4 31 8.8	9 45.4	6 22 1.1	13 45.1	9.5626533	9.9785185	9.9886082
21	170 27 19.9	4 14 12.7	−11 49.4	+5 51 2.6	−17 2.5	9.5762379	9.9982917	0.0075639
23	178 40 10.7	3 58 55.2	12 46.7	5 14 30.1	19 21.3	9.5892622	0.0164257	0.0248830
25	186 24 9.6	3 45 21.0	12 43.5	4 34 8.8	20 53.4	9.6015235	0.0329443	0.0406214
27	193 42 42.2	3 33 28.2	11 49.5	3 51 20.8	21 49.4	9.6128861	0.0479265	0.0548733
29	200 39 6.2	3 23 11.2	10 15.4	3 7 9.4	22 18.2	9.6232634	0.0614757	0.0677480
31	207 16 26.7	3 14 23.4	− 8 11.8	+2 22 21.9	−22 26.6	9.6326048	0.0737038	0.0793565
33	213 37 34.3	3 6 57.0	− 5 48.4	+1 37 33.8	−22 19.4	9.6408833	0.0847197	0.0898050

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. −1	68 36 25.3	1 36 35.9	−0 44.1	−0 25 1.5	+5 41.0	9.8579073	9.7108536	9.6985866
3	75 3 3.4	1 36 43.2	−0 3.8	−0 2 9.8	5 44.1	9.8576249	9.6860813	9.6733412
7	81 30 10.5	1 36 50.3	+0 36.7	+0 20 45.3	5 42.7	9.8573637	9.6603748	9.6471924
11	87 57 46.0	1 36 57.4	1 15.4	0 43 26.1	5 36.9	9.8571272	9.6338126	9.6202602
15	94 25 49.2	1 37 4.2	1 50.4	1 5 35.1	5 26.8	9.8569183	9.6065667	9.5927731
19	100 54 18.9	1 37 10.6	+2 19.7	+1 26 55.2	+5 12.5	9.8567401	9.5789315	9.5651052
23	107 23 13.2	1 37 16.5	2 41.9	1 47 9.7	4 54.1	9.8565947	9.5513693	9.5378114
27	113 52 29.5	1 37 21.6	2 55.9	2 6 2.6	4 31.8	9.8564841	9.5245326	9.5116495
31	120 22 4.8	1 37 25.9	3 0.9	2 23 19.1	4 5.9	9.8564098	9.4992954	9.4876163
Feb. 4	126 51 55.4	1 37 29.2	2 56.7	2 38 45.6	3 36.8	9.8563728	9.4767721	9.4669347
8	133 21 57.0	1 37 31.4	+2 43.4	+2 52 9.9	+3 4.9	9.8563737	9.4582829	9.4509895
12	139 52 4.9	1 37 32.4	2 21.7	3 3 21.5	2 30.5	9.8564124	9.4452209	9.4411217
16	146 22 13.9	1 37 32.0	1 52.7	3 12 11.7	1 54.2	9.8564884	9.4387999	9.4383249
20	152 52 18.5	1 37 30.1	1 18.0	3 18 33.6	1 16.5	9.8566009	9.4397168	9.4429437
24	159 22 13.0	1 37 26.9	+0 39.4	3 22 22.5	+0 37.8	9.8567482	9.4479281	9.4545492
28	165 51 51.9	1 37 22.3	−0 1.3	+3 23 35.7	−0 1.2	9.8569285	9.4626588	9.4720838
Mar. 4	172 21 9.7	1 37 16.4	0 41.9	3 22 12.7	0 40.2	9.8571394	9.4826463	9.4941722
8	178 50 1.2	1 37 9.2	1 20.3	3 18 15.0	1 18.5	9.8573780	9.5064901	9.5194399
12	185 18 21.5	1 37 0.8	1 54.5	3 11 46.1	1 55.7	9.8576413	9.5328803	9.5466825
16	191 46 6.6	1 36 51.6	2 22.9	3 2 51.7	2 31.2	9.8579258	9.5607334	9.5749369
20	198 13 13.1	1 36 41.6	−2 44.1	+2 51 39.1	−3 4.7	9.8582279	9.5892083	9.6034767
24	204 39 38.2	1 36 30.9	2 57.0	2 38 17.5	3 35.6	9.8585435	9.6176801	9.6317707
28	211 5 20.3	1 36 20.0	3 1.0	2 22 57.8	4 3.7	9.8588687	9.6457104	9.6594659
Apr. 1	217 30 18.3	1 36 9.0	2 55.9	2 5 51.9	4 28.6	9.8591995	9.6730137	9.6863387
5	223 54 32.1	1 35 58.0	2 42.0	1 47 13.4	4 50.0	9.8595314	9.6994278	9.7122737
9	230 18 2.9	1 35 47.4	−2·20.1	+1 27 16.5	−5 7.8	9.8598604	9.7248743	9.7372270
13	236 40 52.2	1 35 37.3	1 51.4	1 6 16.6	5 21.6	9.8601824	9.7493313	9.7611888
17	243 3 2.5	1 35 27.9	1 17.1	0 44 29.3	5 31.4	9.8604934	9.7728005	9.7841678
21	249 24 37.0	1 35 19.4	−0 39.2	+0 22 10.9	5 37.1	9.8607896	9.7952924	9.8061765
25	255 45 39.2	1 35 11.9	+0 0.6	−0 0 22.0	5 38.7	9.8610674	9.8168235	9.8272371
29	262 6 13.3	1 35 5.4	+0 40.4	−0 22 53.0	−5 36.2	9.8613234	9.8374198	9.8473769
May 3	268 26 23.8	1 35 0.0	1 18.1	0 45 5.7	5 29.6	9.8615545	9.8571141	9.8666376
7	274 46 15.2	1 34 55.9	1 52.0	1 6 44.1	5 19.0	9.8617580	9.8759528	9.8850662
11	281 5 52.3	1 34 52.9	2 20.4	1 27 32.5	5 4.6	9.8619315	9.8939849	9.9027140
15	287 25 19.7	1 34 51.0	2 42.0	1 47 16.2	4 46.6	9.8620728	9.9112583	9.9196225
19	293 44 41.9	1 34 50.2	+2 55.8	−2 5 40.9	−4 25.2	9.8621803	9.9278109	9.9358265
23	300 4 3.2	1 34 50.5	3 0.9	2 22 33.6	4 0.6	9.8622528	9.9436723	9.9513516
27	306 23 27.5	1 34 51.8	2 57.3	2 37 42.1	3 33.1	9.8622893	9.9588677	9.9662229
31	312 42 58.5	1 34 53.9	2 45.1	2 50 55.5	3 3.1	9.8622896	9.9734217	9.9804677
June 4	319 2 39.5	1 34 56.7	2 24.9	3 2 4.2	2 30.9	9.8622534	9.9873644	9.9941167
8	325 22 33.2	1 35 0.2	+1 57.7	−3 11 0.2	−1 56.8	9.8621816	0.0007287	0.0072037
12	331 42 41.9	1 35 4.2	1 24.6	3 17 36.7	1 21.2	9.8620744	0.0135460	0.0197586
16	338 3 7.8	1 35 8.8	0 47.5	3 21 48.8	0 44.6	9.8619336	0.0258447	0.0318055
20	344 23 52.6	1 35 13.6	+0 8.0	3 23 33.1	−0 7.4	9.8617607	0.0376432	0.0433596
24	350 44 57.5	1 35 18.8	−0 31.9	3 22 48.0	+0 30.0	9.8615578	0.0489565	0.0544348
28	357 6 23.7	1 35 24.3	−1 10.3	−3 19 33.6	+1 7.1	9.8613273	0.0597964	0.0650434
32	3 28 12.1	1 35 29.9	−1 45.3	−3 13 51.9	+1 43.6	9.8610719	0.0701780	0.0752030

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 2	3 28 12.1	1 35 29.9	−1 45.3	−3 13 51.9	+1 43.6	9.8610719	0.0701780	0.0752030
6	9 50 23.5	1 35 35.8	2 15.1	3 5 46.5	2 18.9	9.8607948	0.0801205	0.0849336
10	16 12 58.6	1 35 41.8	2 38.4	2 55 22.8	2 52.6	9.8604992	0.0896447	0.0942560
14	22 35 57.9	1 35 47.9	2 53.8	2 42 48.1	3 24.4	9.8601887	0.0987698	0.1031873
18	28 59 22.1	1 35 54.2	3 0.7	2 28 11.2	3 53.7	9.8598673	0.1075096	0.1117380
22	35 23 11.8	1 36 0.6	−2 58.5	−2 11 42.4	+4 20.2	9.8595387	0.1158732	0.1199158
26	41 47 27.6	1 36 7.3	2 47.5	1 53 33.6	4 43.6	9.8592071	0.1238664	0.1277260
30	48 12 10.3	1 36 14.1	2 26.2	1 33 58.0	5 3.6	9.8588766	0.1314961	0.1351777
Aug. 3	54 37 20.6	1 36 21.1	2 1.3	1 13 10.0	5 19.8	9.8585513	0.1387727	0.1422832
7	61 2 59.0	1 36 28.2	1 28.4	0 51 25.0	5 32.0	9.8582355	0.1457107	0.1490569
11	67 29 5.9	1 36 35.3	−0 51.0	−0 28 59.3	+5 40.1	9.8579330	0.1523239	0.1555126
15	73 55 41.6	1 36 42.5	−0 10.9	−0 6 9.9	5 43.9	9.8576477	0.1586240	0.1616597
19	80 22 46.1	1 36 49.7	+0 29.7	+0 16 46.0	5 43.3	9.8573835	0.1646194	0.1675035
23	86 50 19.2	1 36 56.8	1 8.9	0 39 30.7	5 38.3	9.8571436	0.1703126	0.1730472
27	93 18 20.0	1 37 3.6	1 44.6	1 1 46.7	5 28.9	9.8569313	0.1757078	0.1782947
31	99 46 47.4	1 37 10.0	+2 15.0	+1 23 16.6	+5 15.3	9.8567492	0.1808092	0.1832530
Sept. 4	106 15 39.4	1 37 15.9	2 38.6	1 43 43.7	4 57.6	9.8565998	0.1856275	0.1879337
8	112 44 53.7	1 37 21.2	2 54.1	2 2 52.0	4 36.0	9.8564850	0.1901733	0.1923476
12	119 14 27.4	1 37 25.6	3 0.7	2 20 26.4	4 10.7	9.8564062	0.1944578	0.1965045
16	125 44 16.8	1 37 29.0	2 58.1	2 36 13.0	3 42.1	9.8563648	0.1984884	0.2004100
20	132 14 17.8	1 37 31.3	+2 46.3	+2 49 59.4	+3 10.6	9.8563610	0.2022696	0.2040672
24	138 44 25.7	1 37 32.4	2 26.0	3 1 34.8	2 36.7	9.8563952	0.2058026	0.2074767
28	145 14 35.4	1 37 32.2	1 58.2	3 10 50.1	2 0.7	9.8564665	0.2090902	0.2106437
Oct. 2	151 44 41.4	1 37 30.5	1 24.4	3 17 38.3	1 23.2	9.8565744	0.2121382	0.2135753
6	158 14 38.3	1 37 27.6	0 46.3	3 21 54.1	0 44.6	9.8567173	0.2149557	0.2162812
10	164 44 20.4	1 37 23.2	+0 5.8	+3 23 34.5	+0 5.5	9.8568933	0.2175526	0.2187708
14	171 13 42.1	1 37 17.4	−0 34.9	3 22 38.6	−0 33.5	9.8571002	0.2199368	0.2210512
18	177 42 38.2	1 37 10.4	1 13.8	3 19 7.6	1 11.9	9.8573352	0.2221139	0.2231251
22	184 11 4.1	1 37 2.3	1 48.9	3 13 4.7	1 49.3	9.8575953	0.2240847	0.2249930
26	190 38 55.3	1 36 53.2	2 18.5	3 4 35.2	2 25.2	9.8578771	0.2258504	0.2266571
30	197 6 8.4	1 36 43.2	−2 41.0	+2 53 46.0	−2 59.0	9.8581770	0.2274134	0.2281208
Nov. 3	203 32 40.5	1 36 33.7	2 55.4	2 40 46.3	3 30.4	9.8584910	0.2287799	0.2293920
7	209 58 29.6	1 36 21.8	3 0.9	2 25 46.3	3 59.1	9.8588154	0.2299580	0.2304791
11	216 23 34.8	1 36 10.8	2 57.4	2 8 58.0	4 24.6	9.8591459	0.2309557	0.2313888
15	222 47 56.0	1 35 59.8	2 45.1	1 50 34.7	4 46.6	9.8594780	0.2317784	0.2321243
19	229 11 33.7	1 35 49.1	−2 24.5	+1 30 50.4	−5 4.9	9.8598080	0.2324269	0.2326862
23	235 34 29.5	1 35 38.9	1 56.8	1 10 0.3	5 19.4	9.8601319	0.2329015	0.2330728
27	241 56 45.9	1 35 29.4	1 23.4	0 48 20.2	5 29.9	9.8604452	0.2332004	0.2332848
Dec. 1	248 18 25.8	1 35 20.7	0 46.0	0 26 6.1	5 36.4	9.8607444	0.2333269	0.2333267
5	254 39 32.9	1 35 13.0	−0 6.4	+0 3 34.6	5 38.7	9.8610259	0.2332855	0.2332039
9	261 0 11.1	1 35 6.3	+0 33.5	−0 18 57.9	−5 36.9	9.8612862	0.2330825	0.2329220
13	267 20 24.7	1 35 0.7	1 11.8	0 41 15.0	5 31.0	9.8615220	0.2327223	0.2324837
17	273 40 18.5	1 34 56.4	1 46.5	1 3 0.4	5 21.1	9.8617306	0.2322059	0.2318885
21	279 59 57.2	1 34 53.2	2 16.0	1 23 58.7	5 7.4	9.8619096	0.2315309	0.2311326
25	286 19 25.4	1 34 51.1	2 38.8	1 43 54.7	4 50.0	9.8620567	0.2306936	0.2302132
29	292 38 47.6	1 34 50.2	+2 53.9	−2 2 34.2	−4 29.2	9.8621703	0.2296915	0.2291287
33	298 58 8.1	1 34 50.3	+3 0.7	−2 19 43.8	−4 5.1	9.8622489	0.2285251	0.2278810

MARS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
Jan. 3	138 45 12.4	26 23.46	− 0.2	+1 51 1.5	− 0.09	0.2200946	0.0148657	0.0072627
7	140 30 41.5	26 21.04	3.5	1 50 58.1	1.64	0.2204322	9.9995961	9.9918758
11	142 16 1.2	26 18.91	6.7	1 50 48.4	3.19	0.2207289	9.9841103	9.9763105
15	144 1 13.2	26 17.07	10.0	1 50 32.6	4.74	0.2209846	9.9684875	9.9606515
19	145 46 18.1	26 15.50	13.2	1 50 10.5	6.29	0.2211990	9.9528164	9.9449957
23	147 31 17.5	26 14.28	−16.3	+1 49 42.3	− 7.81	0.2213721	9.9372050	9.9294626
27	149 16 12.4	26 13.29	19.5	1 49 8.0	9.34	0.2215040	9.9217882	9.9142051
31	151 1 4.0	26 12.60	22.5	1 48 27.6	10.85	0.2215944	9.9067377	9.8994134
Feb. 4	152 45 53.6	26 12.22	25.4	1 47 41.2	12.35	0.2216434	9.8922610	9.8853110
8	154 30 42.2	26 12.13	28.3	1 46 48.8	13.85	0.2216510	9.8785939	9.8721429
12	156 15 31.0	26 12.34	−31.1	+1 45 50.4	−15.34	0.2216171	9.8659867	9.8601584
16	158 0 21.3	26 12.85	33.7	1 44 46.1	16.81	0.2215414	9.8546899	9.8496121
20	159 45 14.2	26 13.67	36.2	1 43 35.9	18.28	0.2214247	9.8449548	9.8407484
24	161 30 11.1	26 14.85	38.6	1 42 19.9	19.71	0.2212664	9.8370218	9.8338023
28	163 15 13.0	26 16.28	40.7	1 40 58.2	21.16	0.2210669	9.8311134	9.8289764
Mar. 4	165 0 21.3	26 17.94	−42.8	+1 39 30.6	−22.60	0.2208262	9.8274073	9.8264171
8	166 45 36.9	26 19.92	44.8	1 37 57.4	24.00	0.2205444	9.8260108	9.8261874
12	168 31 1.1	26 22.26	46.6	1 36 18.6	25.41	0.2202216	9.8269388	9.8282543
16	170 16 35.3	26 24.86	48.1	1 34 34.1	26.81	0.2198580	9.8301164	9.8325045
20	172 2 20.4	26 27.75	49.5	1 32 44.1	28.19	0.2194537	9.8353954	9.8387635
24	173 48 17.7	26 30.96	−50.7	+1 30 48.6	−29.56	0.2190090	9.8425818	9.8468223
28	175 34 28.5	26 34.48	51.7	1 28 47.6	30.91	0.2185243	9.8514528	9.8564444
Apr. 1	177 20 54.0	26 38.30	52.6	1 26 41.3	32.24	0.2179995	9.8617653	9.8673821
5	179 7 35.3	26 42.41	53.2	1 24 29.7	33.56	0.2174350	9.8732629	9.8793757
9	180 54 33.7	26 46.83	53.6	1 22 12.8	34.86	0.2168311	9.8856884	9.8921708
13	182 41 50.3	26 51.52	−53.9	+1 19 50.8	−36.14	0.2161879	9.8987958	9.9055370
17	184 29 26.3	26 56.53	53.9	1 17 23.6	37.42	0.2155061	9.9123716	9.9192789
21	186 17 23.0	27 1.86	53.7	1 14 51.4	38.69	0.2147859	9.9262403	9.9332390
25	188 5 41.6	27 7.49	53.3	1 12 14.1	39.92	0.2140278	9.9402599	9.9472901
29	189 54 23.3	27 13.40	52.7	1 9 32.0	41.12	0.2132321	9.9543158	9.9613252
May 3	191 43 29.2	27 19.62	−51.8	+1 6 45.1	−42.31	0.2123993	9.9683062	9.9752492
7	193 33 0.7	27 26.18	50.7	1 3 53.5	43.47	0.2115298	9.9821447	9.9889839
11	195 22 59.0	27 33.00	49.5	1 0 57.3	44.62	0.2106242	9.9957583	0.0024635
15	197 13 25.1	27 40.12	48.0	0 57 56.5	45.74	0.2096834	0.0090939	0.0156461
19	199 4 20.4	27 47.55	46.4	0 54 51.4	46.81	0.2087075	0.0221180	0.0285058
23	200 55 45.9	27 55.28	−44.5	+0 51 42.0	−47.87	0.2076971	0.0348102	0.0410289
27	202 47 43.0	28 3.28	42.4	0 48 28.4	48.91	0.2066532	0.0471614	0.0532060
31	204 40 12.5	28 11.61	40.0	0 45 10.7	49.93	0.2055767	0.0591614	0.0650251
June 4	206 33 16.3	28 20.24	37.7	0 41 49.0	50.88	0.2044680	0.0707966	0.0764751
8	208 26 54.8	28 29.11	35.0	0 38 23.7	51.79	0.2033279	0.0820593	0.0875493
12	210 21 9.6	28 38.35	−32.2	+0 34 54.7	−52.69	0.2021576	0.0929454	0.0982487
16	212 16 2.0	28 47.85	29.3	0 31 22.2	53.54	0.2009577	0.1034601	0.1085815
20	214 11 32.6	28 57.59	26.1	0 27 46.3	54.34	0.1997290	0.1136146	0.1185613
24	216 7 42.7	29 7.60	22.8	0 24 7.5	55.09	0.1984730	0.1234224	0.1281988
28	218 4 33.8	29 17.94	19.5	0 20 25.6	55.81	0.1971904	0.1328913	0.1375006
July 2	220 2 6.6	29 28.52	−16.0	+0 16 41.0	−56.47	0.1958828	0.1420270	0.1464702
6	222 0 22.4	29 39.41	−12.4	+0 12 53.8	−57.09	0.1945510	0.1508317	0.1551116

MARS.

GREENWICH MEAN NOON.

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							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
July 2	220 2 6.6	29 28.52	−16.0	+0 16 41.0	−56.47	0.1958828	0.1420270	0.1464702
6	222 0 22.4	29 39.41	12.4	0 12 53.8	57.09	0.1945510	0.1508317	0.1551116
10	223 59 22.3	29 50.55	8.8	0 9 4.3	57.64	0.1931963	0.1593113	0.1634321
14	225 59 7.2	30 1.90	5.0	0 5 12.7	58.14	0.1918198	0.1674761	0.1714453
18	227 59 37.9	30 13.50	− 1.3	+0 1 19.2	58.58	0.1904233	0.1753420	0.1791665
22	230 0 55.6	30 25.39	+ 2.5	−0 2 35.9	−58.94	0.1890079	0.1829223	0.1866094
26	232 3 1.3	30 37.45	6.3	0 6 32.3	59.25	0.1875753	0.1902292	0.1937828
30	234 5 55.5	30 49.74	10.2	0 10 29.9	59.49	0.1861273	0.1972707	0.2006927
Aug. 3	236 9 39.5	31 2.26	13.9	0 14 28.2	59.63	0.1846651	0.2040498	0.2073427
7	238 14 13.9	31 14.94	17.6	0 18 26.9	59.71	0.1831907	0.2105719	0.2137397
11	240 19 39.3	31 27.81	+21.3	−0 22 25.9	−59.72	0.1817058	0.2168472	0.2198960
15	242 25 56.7	31 40.86	24.9	0 26 24.7	59.63	0.1802123	0.2228877	0.2258244
19	244 33 6.5	31 54.10	28.4	0 30 22.9	59.45	0.1787121	0.2287077	0.2315380
23	246 41 9.7	32 7.50	31.7	0 34 20.3	59.20	0.1772073	0.2343171	0.2370452
27	248 50 6.7	32 20.94	34.8	0 38 16.5	58.83	0.1756998	0.2397231	0.2423512
31	250 59 57.5	32 34.50	+37.9	−0 42 11.0	−58.38	0.1741919	0.2449299	0.2474592
Sept. 4	253 10 42.9	32 48.18	40.7	0 46 3.5	57.84	0.1726859	0.2499406	0.2523746
8	255 22 23.0	33 1.88	43.3	0 49 53.7	57.17	0.1711837	0.2547628	0.2571065
12	257 34 58.0	33 15.65	45.7	0 53 40.9	56.40	0.1696881	0.2594070	0.2616659
16	259 48 28.2	33 29.44	47.7	0 57 24.9	55.54	0.1682010	0.2638848	0.2660649
20	262 2 53.5	33 43.21	+49.5	−1 1 5.2	−54.54	0.1667253	0.2682065	0.2703105
24	264 18 13.9	33 56.97	51.0	1 4 41.3	53.44	0.1652632	0.2723779	0.2744083
28	266 34 29.2	34 10.65	52.3	1 8 12.8	52.24	0.1638177	0.2764023	0.2783604
Oct. 2	268 51 39.0	34 24.24	53.2	1 11 39.2	50.91	0.1623912	0.2802826	0.2821703
6	271 9 43.0	34 37.74	53.7	1 15 0.1	49.45	0.1609865	0.2840241	0.2858450
10	273 28 40.7	34 51.07	+53.9	−1 18 14.8	−47.89	0.1596059	0.2876346	0.2893942
14	275 48 31.4	35 4.20	53.8	1 21 23.2	46.21	0.1582523	0.2911254	0.2928286
18	278 9 14.1	35 17.12	53.3	1 24 24.5	44.39	0.1569283	0.2945043	0.2961541
22	280 30 48.2	35 29.90	52.4	1 27 18.3	42.47	0.1556370	0.2977783	0.2993765
26	282 53 13.0	35 42.34	51.0	1 30 4.3	40.42	0.1543809	0.3009493	0.3024972
30	285 16 26.6	35 54.46	+49.5	−1 32 41.7	−38.26	0.1531626	0.3040201	0.3055181
Nov. 3	287 40 28.3	36 6.29	47.6	1 35 10.4	36.00	0.1519850	0.3069925	0.3084444
7	290 5 16.4	36 17.71	45.4	1 37 29.7	33.61	0.1508506	0.3098739	0.3112829
11	292 30 49.5	36 28.75	42.7	1 39 39.2	31.13	0.1497620	0.3126728	0.3140439
15	294 57 5.8	36 39.31	39.7	1 41 38.7	28.57	0.1487217	0.3153972	0.3167336
19	297 24 3.4	36 49.41	+36.5	−1 43 27.8	−25.89	0.1477324	0.3180541	0.3193563
23	299 51 40.5	36 59.06	32.9	1 45 5.8	23.09	0.1467965	0.3206423	0.3219124
27	302 19 55.2	37 8.12	29.1	1 46 32.5	20.22	0.1459160	0.3231659	0.3244031
Dec. 1	304 48 44.8	37 16.60	25.1	1 47 47.6	17.29	0.1450936	0.3256237	0.3268306
5	307 18 7.2	37 24.51	20.8	1 48 50.8	14.27	0.1443312	0.3280229	0.3292015
9	309 48 0.1	37 31.81	+16.4	−1 49 41.8	−11.20	0.1436307	0.3303679	0.3315224
13	312 18 20.8	37 38.42	11.9	1 50 20.4	8.07	0.1429940	0.3326660	0.3337994
17	314 49 6.6	37 44.35	7.2	1 50 46.4	4.91	0.1424230	0.3349225	0.3360358
21	317 20 14.7	37 49.64	+ 2.5	1 50 59.7	− 1.71	0.1419189	0.3371390	0.3382317
25	319 51 42.8	37 54.24	− 2.2	1 51 0.1	+ 1.51	0.1414832	0.3393140	0.3403860
29	322 23 27.6	37 58.05	− 6.9	−1 50 47.6	+ 4.76	0.1411171	0.3414474	0.3424990
33	324 55 26.2	38 1.14	−11.6	−1 50 22.0	+ 8.01	0.1408215	0.3435411	0.3445742

JUPITER.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
Jan. 3	175 14 2.6	4 33.08	+12.8	+1 16 14.5	+1.51	0.7358856	0.7181975	0.7155455
7	175 32 14.8	4 33.04	12.5	1 16 20.5	1.48	0.7359207	0.7128923	0.7102411
11	175 50 26.9	4 33.00	12.2	1 16 26.3	1.44	0.7359552	0.7075957	0.7049594
15	176 8 38.8	4 32.96	12.0	1 16 32.0	1.41	0.7359891	0.7023359	0.6997288
19	176 26 50.6	4 32.92	11.7	1 16 37.6	1.38	0.7360225	0.6971417	0.6945779
23	176 45 2.2	4 32.88	+11.5	+1 16 43.1	+1.35	0.7360552	0.6920415	0.6895360
27	177 3 13.7	4 32.84	11.2	1 16 48.4	1.31	0.7360873	0.6870659	0.6846353
31	177 21 25.0	4 32.80	10.9	1 16 53.6	1.28	0.7361188	0.6822488	0.6799107
Feb. 4	177 39 36.1	4 32.76	10.7	1 16 58.7	1.25	0.7361497	0.6776258	0.6753988
8	177 57 47.1	4 32.72	10.4	1 17 3.6	1.22	0.7361801	0.6732338	0.6711350
12	178 15 57.9	4 32.69	+10.2	+1 17 8.4	+1.18	0.7362098	0.6691068	0.6671539
16	178 34 8.6	4 32.65	9.9	1 17 13.1	1.15	0.7362390	0.6652797	0.6634887
20	178 52 19.1	4 32.62	9.6	1 17 17.6	1.12	0.7362676	0.6617840	0.6601690
24	179 10 29.5	4 32.59	9.4	1 17 22.0	1.08	0.7362956	0.6586477	0.6572238
28	179 28 39.8	4 32.55	9.1	1 17 26.3	1.05	0.7363229	0.6559008	0.6546824
Mar. 4	179 46 50.0	4 32.52	+ 8.8	+1 17 30.4	+1.02	0.7363497	0.6535714	0.6525712
8	180 5 0.0	4 32.49	8.5	1 17 34.4	0.99	0.7363758	0.6516840	0.6509121
12	180 23 9.9	4 32.46	8.3	1 17 38.3	0.95	0.7364014	0.6502567	0.6497196
16	180 41 19.6	4 32.42	8.0	1 17 42.1	0.92	0.7364263	0.6493015	0.6490035
20	180 59 29.3	4 32.39	7.7	1 17 45.7	0.89	0.7364507	0.6488255	0.6487680
24	181 17 38.8	4 32.36	+ 7.4	+1 17 49.2	+0.86	0.7364744	0.6488307	0.6490137
28	181 35 48.1	4 32.33	7.2	1 17 52.6	0.83	0.7364974	0.6493162	0.6497384
Apr. 1	181 53 57.4	4 32.30	6.9	1 17 55.8	0.80	0.7365198	0.6502781	0.6509345
5	182 12 6.6	4 32.28	6.6	1 17 58.9	0.76	0.7365416	0.6517053	0.6525889
9	182 30 15.7	4 32.26	6.3	1 18 1.9	0.73	0.7365628	0.6535819	0.6546818
13	182 48 24.6	4 32.23	+ 6.0	+1 18 4.8	+0.70	0.7365834	0.6558850	0.6571885
17	183 6 33.5	4 32.21	5.8	1 18 7.5	0.67	0.7366033	0.6585887	0.6600823
21	183 24 42.3	4 32.18	5.5	1 18 10.1	0.63	0.7366227	0.6616656	0.6633353
25	183 42 50.9	4 32.15	5.2	1 18 12.6	0.60	0.7366414	0.6650875	0.6669188
29	184 0 59.5	4 32.13	4.9	1 18 14.9	0.57	0.7366595	0.6688251	0.6708027
May 3	184 19 8.0	4 32.11	+ 4.7	+1 18 17.1	+0.53	0.7366770	0.6728473	0.6749548
7	184 37 16.4	4 32.09	4.4	1 18 19.2	0.50	0.7366939	0.6771206	0.6793403
11	184 55 24.7	4 32.07	4.1	1 18 21.1	0.47	0.7367102	0.6816098	0.6839247
15	185 13 32.9	4 32.05	3.8	1 18 22.9	0.43	0.7367259	0.6862811	0.6886748
19	185 31 41.1	4 32.03	3.5	1 18 24.6	0.40	0.7367410	0.6911024	0.6935599
23	185 49 49.2	4 32.02	+ 3.2	+1 18 26.1	+0.37	0.7367554	0.6960442	0.6985518
27	186 7 57.2	4 32.00	2.9	1 18 27.5	0.33	0.7367693	0.7010794	0.7036234
31	186 26 5.1	4 31.98	2.7	1 18 28.8	0.30	0.7367825	0.7061804	0.7087472
June 4	186 44 13.0	4 31.96	2.4	1 18 29.9	0.27	0.7367952	0.7113204	0.7138963
8	187 2 20.8	4 31.95	2.1	1 18 30.9	0.23	0.7368072	0.7164723	0.7190452
12	187 20 28.6	4 31.93	+ 1.8	+1 18 31.8	+0.20	0.7368186	0.7216125	0.7241713
16	187 38 36.3	4 31.92	1.5	1 18 32.6	0.17	0.7368294	0.7267197	0.7292553
20	187 56 43.9	4 31.91	1.2	1 18 33.2	0.13	0.7368396	0.7317762	0.7342802
24	188 14 51.5	4 31.90	1.0	1 18 33.7	0.10	0.7368492	0.7367654	0.7392296
28	188 32 59.1	4 31.89	0.7	1 18 34.1	0.07	0.7368582	0.7416709	0.7440876
July 2	188 51 6.6	4 31.88	+ 0.4	+1 18 34.3	+0.04	0.7368665	0.7464777	0.7488391
6	189 9 14.1	4 31.87	+ 0.1	+1 18 34.4	+0.01	0.7368743	0.7511701	0.7534690

JUPITER.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
July 2	188 51 6.6	4 31.88	+ 0.4	+1 18 34.3	+0.04	0.7368665	0.7464777	0.7488391
6	189 9 14.1	4 31.87	+ 0.1	1 18 34.4	+0.01	0.7368743	0.7511701	0.7534690
10	189 27 21.6	4 31.86	− 0.2	1 18 34.3	−0.02	0.7368814	0.7557344	0.7579653
14	189 45 29.0	4 31.85	0.5	1 18 34.2	0.06	0.7368879	0.7601604	0.7623186
18	190 3 36.3	4 31.84	0.7	1 18 33.9	0.09	0.7368937	0.7644391	0.7665207
22	190 21 43.7	4 31.83	− 1.0	+1 18 33.5	−0.12	0.7368990	0.7685625	0.7705638
26	190 39 51.0	4 31.83	1.3	1 18 32.9	0.15	0.7369036	0.7725233	0.7744400
30	190 57 58.3	4 31.83	1.6	1 18 32.2	0.19	0.7369076	0.7763129	0.7781409
Aug. 3	191 16 5.6	4 31.82	1.9	1 18 31.4	0.22	0.7369110	0.7799230	0.7816583
7	191 34 12.9	4 31.82	2.2	1 18 30.5	0.25	0.7369138	0.7833464	0.7849868
11	191 52 20.2	4 31.82	− 2.5	+1 18 29.4	−0.29	0.7369159	0.7865787	0.7881219
15	192 10 27.5	4 31.82	2.8	1 18 28.2	0.32	0.7369174	0.7896160	0.7910606
19	192 28 34.8	4 31.82	3.0	1 18 26.8	0.35	0.7369183	0.7924551	0.7937992
23	192 46 42.0	4 31.82	3.3	1 18 25.3	0.39	0.7369185	0.7950923	0.7963336
27	193 4 49.3	4 31.81	3.6	1 18 23.7	0.42	0.7369181	0.7975227	0.7986590
31	193 22 56.5	4 31.81	− 3.9	+1 18 22.0	−0.45	0.7369171	0.7997420	0.8007711
Sept. 4	193 41 3.8	4 31.81	4.2	1 18 20.1	0.48	0.7369154	0.8017460	0.8026665
8	193 59 11.0	4 31.82	4.4	1 18 18.2	0.51	0.7369131	0.8035325	0.8043439
12	194 17 18.3	4 31.82	4.7	1 18 16.0	0.55	0.7369101	0.8051006	0.8058024
16	194 35 25.6	4 31.83	5.0	1 18 13.8	0.58	0.7369065	0.8064490	0.8070405
20	194 53 32.9	4 31.84	− 5.3	+1 18 11.4	−0.61	0.7369023	0.8075762	0.8080558
24	195 11 40.3	4 31.84	5.6	1 18 8.9	0.64	0.7368975	0.8084788	0.8088450
28	195 29 47.7	4 31.85	5.8	1 18 6.2	0.68	0.7368920	0.8091540	0.8094056
Oct. 2	195 47 55.1	4 31.85	6.1	1 18 3.5	0.71	0.7368859	0.8095997	0.8097362
6	196 6 2.5	4 31.86	6.4	1 18 0.6	0.74	0.7368792	0.8098151	0.8098365
10	196 24 10.0	4 31.87	− 6.7	+1 17 57.5	−0.77	0.7368718	0.8098004	0.8097070
14	196 42 17.4	4 31.88	7.0	1 17 54.4	0.81	0.7368638	0.8095561	0.8093476
18	197 0 25.0	4 31.89	7.2	1 17 51.1	0.84	0.7368551	0.8090813	0.8087572
22	197 18 32.6	4 31.90	7.5	1 17 47.6	0.87	0.7368459	0.8083750	0.8079343
26	197 36 40.2	4 31 92	7.8	1 17 44.1	0.90	0.7368360	0.8074351	0.8068774
30	197 54 47.9	4 31.93	− 8.1	+1 17 40.4	−0.94	0.7368255	0.8062613	0.8055868
Nov. 3	198 12 55.7	4 31.94	8.3	1 17 36.6	0.97	0.7368144	0.8048542	0.8040639
7	198 31 3.5	4 31.97	8.6	1 17 32.6	1.00	0.7368027	0.8032160	0.8023110
11	198 49 11.3	4 31.98	8.9	1 17 28.6	1.03	0.7367903	0.8013489	0.8003300
15	199 7 19.2	4 31.98	9.2	1 17 24.4	1.07	0.7367774	0.7992542	0.7981216
19	199 25 27.2	4 32.00	− 9.4	+1 17 20.0	−1.10	0.7367638	0.7969323	0.7956863
23	199 43 35.2	4 32.02	9.7	1 17 15.6	1.13	0.7367497	0.7943840	0.7930258
27	200 1 43.3	4 32.04	10.0	1 17 11.0	1.16	0.7367350	0.7916120	0.7901431
Dec. 1	200 19 51.5	4 32.06	10.2	1 17 6.3	1.19	0.7367197	0.7886197	0.7870423
5	200 37 59.8	4 32.08	10.5	1 17 1.4	1.23	0.7367038	0.7854118	0.7837293
9	200 56 8.2	4 32.10	−10.7	+1 16 56.4	−1.26	0.7366873	0.7819952	0.7802099
13	201 14 16.6	4 32.12	11.0	1 16 51.3	1.29	0.7366701	0.7783741	0.7764885
17	201 32 25.2	4 32.14	11.3	1 16 46.1	1.32	0.7366523	0.7745537	0.7725704
21	201 50 33.8	4 32.16	11.5	1 16 40.7	1.35	0.7366339	0.7705395	0.7684618
25	202 8 42.5	4 32.18	11.8	1 16 35.2	1.39	0.7366149	0.7663386	0.7641712
29	202 26 51.2	4 32.21	−12.1	+1 16 29.6	−1.42	0.7365953	0.7619610	0.7597094
33	202 45 0.1	4 32.23	−12.3	+1 16 23.9	−1.45	0.7365749	0.7574179	0.7550883

SATURN.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
Jan. 3	95 13 4.5	2 14.54	−55.9	−0 44 53.3	+5.58	0.9555089	0.9059852	0.9062991
7	95 22 2.7	2 14.54	55.5	0 44 30.9	5.58	0.9555119	0.9066804	0.9071281
11	95 31 0.8	2 14.53	55.1	0 44 8.6	5.58	0.9555150	0.9076412	0.9082186
15	95 39 59.0	2 14.53	54.7	0 43 46.3	5.59	0.9555182	0.9088589	0.9095609
19	95 48 57.1	2 14.53	54.2	0 43 23.9	5.59	0.9555216	0.9103229	0.9111431
23	95 57 55.2	2 14.52	−53.8	−0 43 1.5	+5.60	0.9555252	0.9120202	0.9129526
27	96 6 53.3	2 14.52	53.4	0 42 39.1	5.60	0.9555289	0.9139386	0.9149765
31	96 15 51.4	2 14.52	53.0	0 42 16.7	5.61	0.9555328	0.9160642	0.9171998
Feb. 4	96 24 49.4	2 14.51	52.5	0 41 54.3	5.61	0.9555368	0.9183812	0.9196064
8	96 33 47.5	2 14.51	52.1	0 41 31.8	5.61	0.9555410	0.9208728	0.9221778
12	96 42 45.5	2 14.51	−51.7	−0 41 9.4	+5.62	0.9555453	0.9235192	0.9248948
16	96 51 43.6	2 14.51	51.2	0 40 46.9	5.62	0.9555498	0.9263021	0.9277386
20	97 0 41.6	2 14.50	50.8	0 40 24.4	5.63	0.9555544	0.9292023	0.9306912
24	97 9 39.6	2 14.50	50.3	0 40 1.9	5.63	0.9555592	0.9322030	0.9337356
28	97 18 37.6	2 14.49	49.9	0 39 39.3	5.63	0.9555642	0.9352867	0.9368542
Mar. 4	97 27 35.5	2 14.49	−49.5	−0 39 16.8	+5.64	0.9555693	0.9384358	0.9400292
8	97 36 33.4	2 14.48	49.0	0 38 54.2	5.64	0.9555746	0.9416322	0.9432424
12	97 45 31.4	2 14.48	48.6	0 38 31.6	5.64	0.9555800	0.9448578	0.9464761
16	97 54 29.3	2 14.47	48.1	0 38 9.1	5.65	0.9555856	0.9480956	0.9497142
20	98 3 27.2	2 14.47	47.7	0 37 46.5	5.65	0.9555913	0.9513303	0.9529421
24	98 12 25.0	2 14.46	−47.2	−0 37 23.8	+5.66	0.9555972	0.9545481	0.9561466
28	98 21 22.9	2 14.46	46.8	0 37 1.2	5.66	0.9556032	0.9577360	0.9593148
Apr. 1	98 30 20.7	2 14.45	46.3	0 36 38.6	5.66	0.9556094	0.9608813	0.9624338
5	98 39 18.5	2 14.45	45.9	0 36 15.9	5.67	0.9556158	0.9639708	0.9654906
9	98 48 16.3	2 14.44	45.4	0 35 53.2	5.67	0.9556223	0.9669920	0.9684734
13	98 57 14.1	2 14.44	−45.0	−0 35 30.5	+5.67	0.9556289	0.9699339	0.9713722
17	99 6 11.8	2 14.43	44.5	0 35 7.8	5.68	0.9556357	0.9727873	0.9741781
21	99 15 9.5	2 14.43	44.1	0 34 45.1	5.68	0.9556427	0.9755438	0.9768835
25	99 24 7.2	2 14.42	43.6	0 34 22.4	5.68	0.9556498	0.9781962	0.9794810
29	99 33 4.9	2 14.42	43.2	0 33 59.6	5.69	0.9556571	0.9807370	0.9819631
May 3	99 42 2.6	2 14.41	−42.7	−0 33 36.9	+5.69	0.9556645	0.9831585	0.9843222
7	99 51 0.3	2 14.41	42.3	0 33 14.1	5.69	0.9556721	0.9854536	0.9865518
11	99 59 57.9	2 14.40	41.8	0 32 51.3	5.70	0.9556798	0.9876163	0.9886464
15	100 8 55.5	2 14.39	41.4	0 32 28.5	5.70	0.9556877	0.9896418	0.9906020
19	100 17 53.0	2 14.39	40.9	0 32 5.7	5.70	0.9556957	0.9915267	0.9924154
23	100 26 50.6	2 14.38	−40.4	−0 31 42.9	+5.71	0.9557039	0.9932676	0.9940829
27	100 35 48.1	2 14.38	40.0	0 31 20.0	5.71	0.9557123	0.9948608	0.9956009
31	100 44 45.6	2 14.37	39.5	0 30 57.2	5.71	0.9557208	0.9963026	0.9969654
June 4	100 53 43.1	2 14.36	39.0	0 30 34.3	5.71	0.9557294	0.9975890	0.9981732
8	101 2 40.5	2 14.36	38.6	0 30 11.5	5.72	0.9557382	0.9987177	0.9992223
12	101 11 37.9	2 14.35	−38.1	−0 29 48.6	+5.72	0.9557472	0.9996869	1.0001114
16	101 20 35.3	2 14.34	37.6	0 29 25.7	5.72	0.9557563	1.0004957	1.0008398
20	101 29 32.7	2 14.34	37.2	0 29 2.8	5.72	0.9557655	1.0011434	1.0014066
24	101 38 30.0	2 14.33	36.7	0 28 39.9	5.73	0.9557749	1.0016291	1.0018105
28	101 47 27.3	2 14.32	36.2	0 28 17.0	5.73	0.9557845	1.0019508	1.0020499
July 2	101 56 24.6	2 14.31	−35.7	−0 27 54.0	+5.73	0.9557942	1.0021075	1.0021237
6	102 5 21.8	2 14.31	−35.3	−0 27 31.1	+5.74	0.9558041	1.0020986	1.0020322

SATURN.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
July 2	101 56 24.6	2 14.31	−35.7	−0 27 54.0	+5.73	0.9557942	1.0021075	1.0021237
6	102 5 21.8	2 14.31	35.3	0 27 31.1	5.74	0.9558041	1.0020986	1.0020322
10	102 14 19.1	2 14.30	34.8	0 27 8.1	5.74	0.9558141	1.0019246	1.0017761
14	102 23 16.3	2 14.30	34.3	0 26 45.2	5.74	0.9558243	1.0015868	1.0013567
18	102 32 13.4	2 14.29	33.9	0 26 22.2	5.74	0.9558346	1 0010860	1.0007747
22	102 41 10.6	2 14.28	−33.4	−0 25 59.2	+5.75	0.9558451	1.0004229	1.0000309
26	102 50 7.7	2 14.28	32.9	0 25 36.2	5.75	0.9558557	0.9995985	0.9991256
30	102 59 4.8	2 14.27	32.4	0 25 13.2	5.75	0.9558665	0.9986127	0.9980598
Aug. 3	103 8 1.8	2 14.26	31.9	0 24 50.2	5.75	0.9558775	0.9974673	0.9968356
7	103 16 58.8	2 14.25	31.4	0 24 27.2	5.76	0.9558885	0.9961652	0.9954565
11	103 25 55.8	2 14.24	−31.0	−0 24 4.1	+5.76	0.9558998	0.9947099	0.9939257
15	103 34 52.8	2 14.23	30.5	0 23 41.1	5.76	0.9559112	0.9931042	0.9922460
19	103 43 49.7	2 14.22	30.0	0 23 18.1	5.76	0.9559227	0.9913513	0.9904207
23	103 52 46.6	2 14.22	29.5	0 22 55.0	5.76	0.9559344	0.9894545	0.9884529
27	104 1 43.4	2 14.21	29.0	0 22 31.9	5.77	0.9559462	0.9874165	0.9863460
31	104 10 40.2	2 14.20	−28.5	−0 22 8.9	+5.77	0.9559582	0.9852422	0.9841058
Sept. 4	104 19 37.0	2 14.19	28.1	0 21 45.8	5.77	0.9559704	0.9829375	0.9817382
8	104 28 33.8	2 14.18	27.6	0 21 22.7	5.77	0.9559827	0.9805087	0.9792501
12	104 37 30.5	2 14.17	27.1	0 20 59.6	5.77	0.9559951	0.9779632	0.9766486
16	104 46 27.2	2 14.16	26.6	0 20 36.5	5.77	0.9560077	0.9753073	0.9739402
20	104 55 23.8	2 14.15	−26.1	−0 20 13.4	+5.78	0.9560204	0.9725482	0.9711320
24	105 4 20.4	2 14.15	25.6	0 19 50.3	5.78	0.9560333	0.9696930	0.9682323
28	105 13 17.0	2 14.14	25.1	0 19 27.2	5.78	0.9560463	0.9667512	0.9652511
Oct. 2	105 22 13.6	2 14.13	24.6	0 19 4.1	5.78	0.9560596	0.9637334	0.9621997
6	105 31 10.1	2 14.12	24.1	0 18 40.9	5.78	0.9560729	0.9606514	0.9590900
10	105 40 6.6	2 14.12	−23.7	−0 18 17.8	+5.79	0.9560864	0.9575171	0.9559342
14	105 49 3.0	2 14.11	23.2	0 17 54.6	5.79	0.9561000	0.9543428	0.9527444
18	105 57 59.4	2 14.09	22.7	0 17 31.5	5.79	0.9561138	0.9511407	0.9495333
22	106 6 55.8	2 14.08	22.2	0 17 8.3	5.79	0.9561278	0.9479242	0.9463151
26	106 15 52.1	2 14.08	21.7	0 16 45.2	5.79	0.9561419	0.9447082	0.9431056
30	106 24 48.4	2 14.07	−21.2	−0 16 22.0	+5.79	0 9561561	0.9415095	0.9399221
Nov. 3	106 33 44.6	2 14.06	20.7	0 15 58.8	5.79	0.9561705	0.9383455	0.9367819
7	106 42 40.8	2 14.05	20.2	0 15 35.7	5.79	0.9561850	0.9352335	0.9337024
11	106 51 37.0	2 14.03	19.7	0 15 12.5	5.79	0.9561997	0.9321908	0.9307006
15	107 0 33.1	2 14.02	19.2	0 14 49.3	5.80	0.9562145	0.9292341	0.9277936
19	107 9 29.1	2 14.01	−18.7	−0 14 26.1	+5.80	0.9562295	0.9263813	0.9249995
23	107 18 25.2	2 14.01	18.2	0 14 2.9	5.80	0.9562446	0.9236508	0.9223375
27	107 27 21.2	2 13.99	17.7	0 13 39.7	5.80	0.9562599	0.9210621	0.9198270
Dec. 1	107 36 17.1	2 13.98	17.2	0 13 16.5	5.80	0.9562753	0.9186344	0.9174865
5	107 45 13.0	2 13.97	16.7	0 12 53.3	5.80	0.9562909	0.9163853	0.9153329
9	107 54 8.9	2 13.96	−16.2	−0 12 30.1	+5.80	0.9563066	0.9143309	0.9133813
13	108 3 4.8	2 13.95	15.7	0 12 6.9	5.80	0.9563225	0.9124858	0.9116461
17	108 12 0.6	2 13.94	15.2	0 11 43.7	5.80	0.9563385	0.9108639	0.9101409
21	108 20 56.3	2 13.93	14.7	0 11 20.5	5.81	0.9563546	0.9094787	0.9088793
25	108 29 52.0	2 13.92	14.2	0 10 57.3	5.81	0.9563709	0.9083435	0.9078728
29	108 38 47.7	2 13.91	−13.7	−0 10 34.0	+5.81	0.9563874	0.9074680	0.9071301
33	108 47 43.3	2 13.90	−13.2	−0 10 10.8	+5.81	0.9564040	0.9068595	0.9066570

URANUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	″	″	° ′ ″	″			
Jan. 3	184 37 20.2	46.53	−6.31	+0 43 15.0	−0.23	1.2628932	1.2600606	1.2584276
11	184 43 32.5	46.53	6.34	0 43 13.2	0.23	1.2629032	1.2568078	1.2552098
19	184 49 44.7	46.52	6.36	0 43 11.4	0.23	1.2629133	1.2536417	1.2521116
27	184 55 56.9	46.52	6.39	0 43 9.5	0.23	1.2629234	1.2506274	1.2491972
Feb. 4	185 2 9.1	46.52	6.41	0 43 7.7	0.23	1.2629336	1.2478295	1.2465326
12	185 8 21.3	46.52	−6.44	+0 43 5.9	−0.23	1.2629438	1.2453141	1.2441807
20	185 14 33.5	46.52	6.47	0 43 4.0	0.23	1.2629541	1.2431389	1.2421939
28	185 20 45.6	46.52	6.49	0 43 2.2	0.23	1.2629644	1.2413517	1.2406177
Mar. 8	185 26 57.8	46.52	6.51	0 43 0.3	0.23	1.2629748	1.2399966	1.2394920
16	185 33 9.9	46.51	6.54	0 42 58.4	0.23	1.2629852	1.2391062	1.2388414
24	185 39 22.0	46.51	−6.56	+0 42 56.6	−0.24	1.2629957	1.2386979	1.2386769
Apr. 1	185 45 34.1	46.51	6.58	0 42 54.7	0.24	1.2630062	1.2387783	1.2390016
9	185 51 46.1	46.51	6.61	0 42 52.8	0.24	1.2630168	1.2393457	1.2398056
17	185 57 58.2	46.50	6.63	0 42 50.9	0.24	1.2630275	1.2403789	1.2410633
25	186 4 10.2	46.50	6.65	0 42 49.0	0.24	1 2630381	1.2418521	1.2427416
May 3	186 10 22.2	46.50	−6.68	+0 42 47.0	−0.24	1.2630489	1.2437267	1.2448012
11	186 16 34.2	46.50	6.70	0 42 45.1	0.24	1.2630596	1.2459586	1.2471915
19	186 22 46.2	46.50	6.72	0 42 43.2	0.24	1.2630705	1.2484928	1.2498558
27	186 28 58.1	46.49	6.75	0 42 41.2	0.24	1.2630814	1.2512738	1.2527394
June 4	186 35 10.1	46.49	6.77	0 42 39.3	0.24	1.2630923	1.2542453	1.2557830
12	186 41 22.0	46.49	−6.79	+0 42 37.3	−0.25	1.2631033	1.2573450	1.2589237
20	186 47 33.9	46.49	6.82	0 42 35.3	0.25	1.2631143	1.2605127	1.2621037
28	186 53 45.8	46.48	6.84	0 42 33.4	0.25	1.2631254	1.2636916	1.2652688
July 6	186 59 57.7	46.48	6.86	0 42 31.4	0.25	1.2631365	1.2668279	1.2683623
14	187 6 9.5	46.48	6.89	0 42 29.4	0.25	1.2631477	1.2698658	1.2713329
22	187 12 21.3	46.48	−6.91	+0 42 27.4	−0.25	1.2631589	1.2727584	1.2741365
30	187 18 33.2	46.48	6.93	0 42 25.4	0.25	1.2631702	1.2754624	1.2767303
Aug. 7	187 24 44.9	46.47	6.96	0 42 23.3	0.25	1.2631815	1.2779352	1.2790734
15	187 30 56.7	46.47	6.98	0 42 21.3	0.25	1.2631929	1.2801407	1.2811337
23	187 37 8.5	46.47	7.00	0 42 19.3	0.25	1.2632044	1.2820492	1.2828834
31	187 43 20.2	46.47	−7.03	+0 42 17.2	−0.26	1.2632158	1.2836331	1.2842951
Sept. 8	187 49 31.9	46.46	7.05	0 42 15.2	0.26	1.2632274	1.2848671	1.2853479
16	187 55 43.6	46.46	7.07	0 42 13.1	0.26	1.2632390	1.2857354	1.2860287
24	188 1 55.3	46.46	7.09	0 42 11.1	0.26	1.2632506	1.2862257	1.2863252
Oct. 2	188 8 6.9	46.46	7.12	0 42 9.0	0.26	1.2632622	1.2863264	1.2862291
10	188 14 18.6	46.45	−7.14	+0 42 6.9	−0.26	1.2632740	1.2860338	1.2857412
18	188 20 30.2	46.45	7.16	0 42 4.8	0.26	1.2632858	1.2853518	1.2848664
26	188 26 41.8	46.45	7.18	0 42 2.7	0.26	1.2632976	1.2842857	1.2836113
Nov. 3	188 32 53.4	46.45	7.20	0 42 0.6	0.26	1.2633095	1.2828459	1.2819915
11	188 39 4.9	46.44	7.22	0 41 58.5	0.27	1.2633215	1.2810519	1.2800301
19	188 45 16.5	46.44	−7.24	+0 41 56.4	−0.27	1.2633335	1.2789291	1.2777528
27	188 51 28.0	46.44	7.26	0 41 54.2	0.27	1.2633455	1.2765049	1.2751907
Dec. 5	188 57 39.5	46.44	7.28	0 41 52.1	0.27	1.2633576	1.2738160	1.2723867
13	189 3 51.0	46.43	7.30	0 41 49.9	0.27	1.2633698	1.2709081	1.2693863
21	189 10 2.4	46.43	7.33	0 41 47.8	0.27	1.2633819	1.2678272	1 2662379
29	189 16 13.9	46.43	−7.35	+0 41 45.6	−0.27	1.2633942	1.2646259	1.2629995
37	189 22 25.3	46.42	−7.37	+0 41 43.4	−0.27	1.2634065	1.2613664	

NEPTUNE.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	″	″	° ′ ″	″			
Jan. 3	54 27 58.2	22.03	−23.3	−1 43 41.2	+0.16	1.4744788	1.4650545	1.4658701
11	54 30 54.4	22.03	23.3	1 43 39.9	0.17	1.4744787	1.4667269	1.4676201
19	54 33 50.7	22.03	23.4	1 43 38.6	0.17	1.4744786	1.4685447	1.4694958
27	54 36 46.9	22.03	23.6	1 43 37.3	0.17	1.4744784	1.4704686	1.4714583
Feb. 4	54 39 43.2	22.03	23.6	1 43 36.0	0.17	1.4744783	1.4724597	1.4734676
12	54 42 39.4	22.03	−23.6	−1 43 34.6	+0.17	1.4744781	1.4744768	1.4754819
20	54 45 35.6	22.03	23.7	1 43 33.3	0.17	1.4744780	1.4764787	1.4774628
28	54 48 31.9	22.03	23.8	1 43 31.9	0.17	1.4744779	1.4784297	1.4793751
Mar. 8	54 51 28.1	22.03	23.9	1 43 30.6	0.17	1.4744777	1.4802945	1.4811829
16	54 54 24.3	22.03	23.9	1 43 29.2	0.17	1.4744776	1.4820375	1.4828548
24	54 57 20.5	22.02	−24.0	−1 43 27.9	+0.17	1.4744775	1.4836317	1.4843651
Apr. 1	55 0 16.7	22.02	24.1	1 43 26.5	0.17	1.4744774	1.4850522	1.4856900
9	55 3 13.0	22.02	24.2	1 43 25.1	0.17	1.4744773	1.4862761	1.4868078
17	55 6 9.2	22.02	24.2	1 43 23.8	0.17	1.4744772	1.4872841	1.4877032
25	55 9 5.4	22.02	24.3	1 43 22.4	0.17	1.4744771	1.4880641	1.4883654
May 3	55 12 1.6	22.02	−24.4	−1 43 21.0	+0.17	1.4744771	1.4886060	1.4887849
11	55 14 57.8	22.02	24.5	1 43 19.6	0.17	1.4744770	1.4889014	1.4889557
19	55 17 54.0	22.02	24.5	1 43 18.2	0.17	1.4744769	1.4889480	1.4888786
27	55 20 50.1	22.02	24.6	1 43 16.8	0.17	1.4744769	1.4887475	1.4885550
June 4	55 23 46.3	22.02	24.7	1 43 15.4	0.17	1.4744768	1.4883022	1.4879898
12	55 26 42.5	22.02	−24.8	−1 43 14.0	+0.18	1.4744768	1.4876195	1.4871929
20	55 29 38.7	22.02	24.8	1 43 12.6	0.18	1.4744768	1.4867116	1.4861771
28	55 32 34.9	22.02	24.9	1 43 11.2	0.18	1.4744768	1.4855916	1.4849566
July 6	55 35 31.0	22.02	25.0	1 43 9.8	0.18	1.4744768	1.4842752	1.4835501
14	55 38 27.2	22.02	25.1	1 43 8.4	0.18	1.4744767	1.4827841	1.4819803
22	55 41 23.4	22.02	−25.1	−1 43 7.0	+0.18	1.4744767	1.4811416	1.4802706
30	55 44 19.6	22.02	25.2	1 43 5.5	0.18	1.4744767	1.4793716	1.4784485
Aug. 7	55 47 15.7	22.02	25.3	1 43 4.1	0.18	1.4744768	1.4775051	1.4765451
15	55 50 11.8	22.02	25.4	1 43 2.7	0.18	1.4744768	1.4755726	1.4745918
23	55 53 8.0	22.02	25.4	1 43 1.2	0.18	1.4744768	1.4736072	1.4726229
31	55 56 4.1	22.02	−25.5	−1 42 59.8	+0.18	1.4744768	1.4716437	1.4706743
Sept. 8	55 59 0.3	22.02	25.6	1 42 58.3	0.18	1.4744769	1.4697195	1.4687837
16	56 1 56.4	22.02	25.6	1 42 56.9	0.18	1.4744769	1.4678715	1.4669877
24	56 4 52.6	22.02	25.7	1 42 55.4	0.18	1.4744770	1.4661366	1.4653227
Oct. 2	56 7 48.7	22.02	25.8	1 42 54.0	0.18	1.4744771	1.4645505	1.4638252
10	56 10 44.8	22.02	−25.8	−1 42 52.5	+0.18	1.4744772	1.4631499	1.4625286
18	56 13 41.0	22.02	25.9	1 42 51.0	0.18	1.4744773	1.4619645	1.4614612
26	56 16 37.1	22.02	26.0	1 42 49.6	0.18	1.4744773	1.4610215	1.4606491
Nov. 3	56 19 33.2	22.01	26.1	1 42 48.1	0.19	1.4744774	1.4603456	1.4601135
11	56 22 29.3	22.01	26.1	1 46 46.6	0.19	1.4744775	1.4599536	1.4598674
19	56 25 25.4	22.01	−26.2	−1 42 45.1	+0.19	1.4744777	1.4598551	1.4599175
27	56 28 21.6	22.01	26.3	1 42 43.6	0.19	1.4744778	1.4600542	1.4602656
Dec. 5	56 31 17.7	22.01	26.3	1 42 42.1	0.19	1.4744779	1.4605495	1.4609045
13	56 34 13.8	22.01	26.4	1 42 40.6	0.19	1.4744781	1.4613281	1.4618185
21	56 37 9.9	22.01	26.5	1 42 39.1	0.19	1.4744782	1.4623727	1.4629885
29	56 40 6.0	22.01	−26.6	−1 42 37.6	+0.19	1.4744784	1.4636616	1.4643885
37	56 43 2.1	22.01	−26.6	−1 42 36.1	+0.19	1.4744786	1.4651645	

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Jan. 0	+0.1715669	+0.1801745	+126	−0.8882228	−0.8867886	+201	−0.3853137	−0.3846913	−407
1	0.1887685	0.1973481	118	0.8852850	0.8837122	201	0.3840389	0.3833565	406
2	0.2059126	0.2144612	109	0.8820702	0.8803592	201	0.3826441	0.3819019	404
3	0.2229932	0.2315079	101	0.8785793	0.8767307	201	0.3811297	0.3803279	402
4	0.2400045	0.2484826	93	0.8748134	0.8728278	200	0.3794963	0.3786351	400
5	+0.2569412	+0.2653799	+ 85	−0.8707737	−0.8686517	+199	−0.3777443	−0.3768240	−398
6	0.2737977	0.2821941	77	0.8664616	0.8642039	197	0.3758742	0.3748951	396
7	0.2905682	0.2989194	69	0.8618786	0.8594860	195	0.3738865	0.3728490	394
8	0.3072468	0.3155501	62	0.8570262	0.8544996	193	0.3717821	0.3706864	392
9	0.3238282	0.3320810	54	0.8519062	0.8492465	191	0.3695617	0.3684083	390
10	+0.3403075	+0.3485072	+ 47	−0.8465204	−0.8437287	+188	−0.3672262	−0.3660155	−388
11	0.3566795	0.3648236	40	0.8408711	0.8379484	185	0.3647763	0.3635087	386
12	0.3729390	0.3810249	33	0.8349605	0.8319079	181	0.3622129	0.3608889	383
13	0.3890808	0.3971060	26	0.8287907	0.8256093	177	0.3595370	0.3581571	381
14	0.4050999	0.4130622	20	0.8223639	0.8190549	173	0.3567496	0.3553143	378
15	+0.4209920	+0.4288891	+ 13	−0.8156824	−0.8122470	+169	−0.3538515	−0.3523614	−375
16	0.4367526	0.4445821	7	0.8087487	0.8051882	165	0.3508439	0.3492994	372
17	0.4523770	0.4601367	+ 1	0.8015654	0.7978809	161	0.3477279	0.3461295	370
18	0.4678605	0.4755481	− 5	0.7941347	0.7903273	156	0.3445044	0.3428526	367
19	0.4831986	0.4908120	11	0.7864589	0.7825297	151	0.3411743	0.3394696	364
20	+0.4983875	+0.5059243	− 17	−0.7785401	−0.7744904	+146	−0.3377386	−0.3359816	−361
21	0.5134222	0.5208807	23	0.7703807	0.7662115	141	0.3341986	0.3323898	358
22	0.5282992	0.5356770	28	0.7619834	0.7576965	135	0.3305553	0.3286953	355
23	0.5430137	0.5503087	33	0.7533507	0.7489467	129	0.3268099	0.3248992	352
24	0.5575613	0.5647713	38	0.7444848	0.7399653	123	0.3229633	0.3210024	349
25	+0.5719378	+0.5790605	− 43	−0.7353881	−0.7307541	+117	−0.3190164	−0.3170059	−346
26	0.5861387	0.5931718	47	0.7260631	0.7213159	110	0.3149705	0.3129110	343
27	0.6001593	0.6071006	52	0.7165125	0.7116535	104	0.3108270	0.3087190	340
28	0.6139953	0.6208427	56	0.7067393	0.7017700	97	0.3065870	0.3044312	336
29	0.6276423	0.6343936	60	0.6967462	0.6916681	90	0.3022517	0.3000488	333
30	+0.6410959	+0.6477488	− 64	−0.6865362	−0.6813508	+ 83	−0.2978224	−0.2955730	−330
31	0.6543516	0.6609040	68	0.6761123	0.6708212	76	0.2933006	0.2910054	327
Feb. 1	0.6674052	0.6738549	71	0.6654779	0.6600828	69	0.2886877	0.2863474	323
2	0.6802523	0.6865971	74	0.6546363	0.6491389	62	0.2839849	0.2816003	320
3	0.6928886	0.6991264	77	0.6435909	0.6379930	55	0.2791938	0.2767657	316
4	+0.7053099	+0.7114387	− 80	−0.6323454	−0.6266490	+ 48	−0.2743161	−0.2718453	−313
5	0.7175122	0.7235301	82	0.6209039	0.6151110	40	0.2693535	0.2668409	309
6	0.7294917	0.7353969	84	0.6092705	0.6033830	33	0.2643076	0.2617540	306
7	0.7412449	0.7470356	86	0.5974490	0.5914691	25	0.2591800	0.2565861	302
8	0.7527684	0.7584426	88	0.5854436	0.5793733	17	0.2539727	0.2513398	299
9	+0.7640582	+0.7696144	− 90	−0.5732583	−0.5670996	+ 9	−0.2486874	−0.2460160	−295
10	0.7751110	0.7805476	91	0.5608974	0.5546523	+ 1	0.2433257	0.2406168	292
11	0.7859241	0.7912400	92	0.5483648	0.5420355	− 7	0.2378894	0.2351439	288
12	0.7964949	0.8016886	93	0.5356648	0.5292534	15	0.2323803	0.2295991	284
13	0.8068208	0.8118908	94	0.5228018	0.5163105	23	0.2268003	0.2239643	280
14	+0.8168985	+0.8218436	− 95	−0.5097798	−0.5032105	− 31	−0.2211512	−0.2183013	−276
15	+0.8267256	+0.8315442	− 95	−0.4966030	−0.4899579	− 39	−0.2154348	−0.2125520	−272

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Feb. 15	+0.8267256	+0.8315442	−95	−0.4966030	−0.4899579	− 39	−0.2154348	−0.2125520	−272
16	0.8362992	0.8409904	95	0.4832755	0.4765566	47	0.2096529	0.2067380	268
17	0.8456174	0.8501800	95	0.4698012	0.4630103	56	0.2038072	0.2008610	264
18	0.8546780	0.8591108	95	0.4561840	0.4493231	64	0.1978994	0.1949228	261
19	0.8634784	0.8677803	94	0.4424280	0.4354991	72	0.1919313	0.1889252	257
20	+0.8720162	+0.8761860	−93	−0.4285371	−0.4215423	− 80	−0.1859047	−0.1828700	−243
21	0.8802891	0.8843254	93	0.4145154	0.4074568	88	0.1798213	0.1767589	249
22	0.8882946	0.8921963	92	0.4003671	0.3932467	96	0.1736830	0.1705938	245
23	0.8960304	0.8997965	90	0.3860963	0.3789161	104	0.1674916	0.1643766	241
24	0.9034944	0.9071237	89	0.3717068	0.3644689	112	0.1612490	0.1581090	237
25	+0.9106842	+0.9141756	−87	−0.3572027	−0.3499092	−120	−0.1549568	−0.1517927	−232
26	0.9175975	0.9209498	85	0.3425884	0.3352413	128	0.1486167	0.1454293	228
27	0.9242320	0.9274441	83	0.3278683	0.3204700	136	0.1422310	0.1390218	224
28	0.9305857	0.9336564	81	0.3130471	0.3055999	144	0.1358017	0.1325713	220
Mar. 1	0.9366561	0.9395846	78	0.2981293	0.2906356	152	0.1293306	0.1260801	215
2	+0.9424417	+0.9452269	−75	−0.2831195	−0.2755816	−160	−0.1228197	−0.1195501	−211
3	0.9479403	0.9505814	72	0.2680224	0.2604427	168	0.1162713	0.1129833	207
4	0.9531502	0.9556464	69	0.2528430	0.2452240	176	0.1096867	0.1063819	203
5	0.9580699	0.9604206	66	0.2375862	0.2299305	183	0.1030689	0.0997481	198
6	0.9626982	0.9649027	63	0.2222573	0.2145674	191	0.0964197	0.0930841	194
7	+0.9670337	+0.9690913	−59	−0.2068613	−0.1991396	−198	−0.0897414	−0.0863921	−189
8	0.9710752	0.9729852	56	0.1914029	0.1836520	205	0.0830361	0.0796741	185
9	0.9748213	0.9765836	52	0.1758873	0.1681097	212	0.0763058	0.0729321	180
10	0.9782721	0.9798867	48	0.1603196	0.1525177	219	0.0695527	0.0661683	175
11	0.9814272	0.9828936	44	0.1447046	0.1368810	226	0.0627789	0.0593851	170
12	+0.9842860	+0.9856041	−40	−0.1290474	−0.1212045	−233	−0.0559868	−0.0525846	−165
13	0.9868480	0.9880176	36	0.1133528	0.1054930	240	0.0491784	0.0457687	160
14	0.9891130	0.9901342	32	0.0976255	0.0897513	247	0.0423555	0.0389394	155
15	0.9910811	0.9919538	27	0.0818705	0.0739840	254	0.0355203	0.0320989	150
16	0.9927522	0.9934764	22	0.0660922	0.0581958	261	0.0286750	0.0252494	145
17	+0.9941263	+0.9947022	−17	−0.0502953	−0.0423913	−268	−0.0218218	−0.0183928	−141
18	0.9952038	0.9956312	12	0.0344843	0.0265751	275	0.0149624	0.0115310	136
19	0.9959843	0.9962635	6	0.0186641	−0.0107516	281	0.0080986	−0.0046658	131
20	0.9964685	0.9965995	− 1	−0.0028383	+0.0050751	288	−0.0012325	+0.0022007	126
21	0.9966565	0.9966394	+ 5	+0.0129883	0.0209006	294	+0.0056339	0.0090666	122
22	+0.9965484	+0.9963832	+10	+0.0288116	+0.0367206	−301	+0.0124987	+0.0159299	−117
23	0.9961441	0.9958309	16	0.0446270	0.0525305	307	0.0193600	0.0227888	112
24	0.9954436	0.9949826	22	0.0604303	0.0683260	313	0.0262160	0.0296414	107
25	0.9944473	0.9938386	28	0.0762172	0.0841028	319	0.0330648	0.0364857	102
26	0.9931558	0.9923995	34	0.0919826	0.0998558	325	0.0399041	0.0433196	97
27	+0.9915694	+0.9906656	+40	+0.1077220	+0.1155805	−331	+0.0467319	+0.0501409	− 92
28	0.9896883	0.9886371	46	0.1234308	0.1312723	337	0.0535462	0.0569477	87
29	0.9875125	0.9863143	53	0.1391043	0.1469265	342	0.0603451	0.0637381	81
30	0.9850426	0.9836977	59	0.1547381	0.1625386	348	0.0671266	0.0705102	76
31	0.9822795	0.9807883	66	0.1703275	0.1781038	353	0.0738887	0.0772618	70
32	+0.9792241	+0.9775872	+73	+0.1858673	+0.1936168	−358	+0.0806292	+0.0839908	− 64
33	+0.9758777	+0.9740956	+80	+0.2013522	+0.2090726	−363	+0.0873461	+0.0906950	− 58

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Apr. 1	+0.9792241	+0.9775872	+ 73	+0.1858673	+0.1936168	−358	+0.0806292	+0.0839908	− 64
2	0.9758777	0.9740956	80	0.2013522	0.2090726	363	0.0873461	0.0906950	58
3	0.9722412	0.9703145	87	0.2167777	0.2244666	368	0.0940372	0.0973724	52
4	0.9683157	0.9662451	94	0.2321389	0.2397940	373	0.1007004	0.1040209	47
5	0.9641026	0.9618888	101	0.2474312	0.2550501	378	0.1073338	0.1106386	41
6	+0.9596035	+0.9572474	+109	+0.2626499	+0.2702302	−383	+0.1139353	+0.1172234	− 36
7	0.9548204	0.9523231	116	0.2777902	0.2853294	388	0.1205029	0.1237734	31
8	0.9497556	0.9471181	124	0.2928471	0.3003430	393	0.1270346	0.1302864	25
9	0.9444111	0.9416346	132	0.3078162	0.3152665	398	0.1335284	0.1367605	20
10	0.9387890	0.9358744	140	0.3226932	0.3300959	402	0.1399823	0.1431938	14
11	+0.9328912	+0.9298396	+148	+0.3374739	+0.3448271	−407	+0.1463946	+0.1495846	− 9
12	0.9267199	0.9235325	156	0.3521544	0.3594558	411	0.1527636	0.1559312	− 3
13	0.9202777	0.9169558	164	0.3667304	0.3739779	416	0.1590874	0.1622317	+ 3
14	0.9135673	0.9101121	173	0.3811978	0.3883895	420	0.1653641	0.1684843	9
15	0.9065910	0.9030039	181	0.3955528	0.4026869	424	0.1715920	0.1746873	14
16	+0.8993512	+0.8956333	+190	+0.4097916	+0.4168663	−428	+0.1777696	+0.1808391	+ 20
17	0.8918502	0.8880026	199	0.4239106	0.4309240	432	0.1838953	0.1869381	26
18	0.8840903	0.8801142	208	0.4379062	0.4448566	435	0.1899673	0.1929827	32
19	0.8760740	0.8719705	217	0.4517748	0.4586604	438	0.1959841	0.1989713	38
20	0.8678035	0.8635738	226	0.4655129	0.4723318	441	0.2019442	0.2049023	43
21	+0.8592812	+0.8549265	+235	+0.4791167	+0.4858670	−444	+0.2078458	+0.2107742	+ 49
22	0.8505096	0.8460310	245	0.4925823	0.4992622	447	0.2136874	0.2165852	55
23	0.8414910	0.8368899	254	0.5059060	0.5125136	450	0.2194673	0.2223336	61
24	0.8322281	0.8275057	264	0.5190843	0.5256178	452	0.2251838	0.2280178	67
25	0.8227233	0.8178809	273	0.5321136	0.5385711	455	0.2308354	0.2336364	73
26	+0.8129791	+0.8080181	+283	+0.5449900	+0.5513696	−457	+0.2364206	+0.2391878	+ 79
27	0.8029982	0.7979200	293	0.5577095	0.5640093	459	0.2419378	0.2446703	85
28	0.7927835	0.7875893	303	0.5702684	0.5764865	461	0.2473852	0.2500823	91
29	0.7823377	0.7770291	313	0.5826630	0.5887974	463	0.2527613	0.2554221	97
30	0.7716639	0.7662425	323	0.5948894	0.6009382	464	0.2580645	0.2606882	103
May 1	+0.7607654	+0.7552330	+333	+0.6069436	+0.6129049	−465	+0.2632931	+0.2658789	+109
2	0.7496458	0.7440042	343	0.6188218	0.6246939	466	0.2684454	0.2709925	115
3	0.7383087	0.7325597	353	0.6305207	0.6363019	467	0.2735199	0.2760276	121
4	0.7267577	0.7209030	364	0.6420369	0.6477255	468	0.2785153	0.2809828	127
5	0.7149962	0.7090376	374	0.6533670	0.6589612	468	0.2834301	0.2858568	133
6	+0.7030279	+0.6969674	+385	+0.6645074	+0.6700057	−468	+0.2882629	+0.2906481	+139
7	0.6908567	0.6846963	396	0.6754552	0.6808559	468	0.2930122	0.2953552	145
8	0.6784868	0.6722287	407	0.6862072	0.6915089	468	0.2976767	0.2999768	152
9	0.6659226	0.6595690	418	0.6967606	0.7019620	468	0.3022552	0.3045118	158
10	0.6531683	0.6467212	429	0.7071125	0.7122121	467	0.3067464	0.3089589	165
11	+0.6402278	+0.6336891	+440	+0.7172602	+0.7222567	−467	+0.3111491	+0.3133169	+171
12	0.6271050	0.6204766	451	0.7272013	0.7320936	466	0.3154622	0.3175849	178
13	0.6138039	0.6070878	462	0.7369335	0.7417204	465	0.3196847	0.3217618	184
14	0.6003285	0.5935267	474	0.7464544	0.7511348	464	0.3238157	0.3258466	191
15	0.5866828	0.5797973	485	0.7557618	0.7603348	462	0.3278540	0.3298382	197
16	+0.5728707	+0.5659036	+497	+0.7648537	+0.7693182	−460	+0.3317987	+0.3337357	+203
17	+0.5588962	+0.5518494	+508	+0.7737280	+0.7780828	−458	+0.3356488	+0.3375381	+209

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
May 17	+0.5588962	+0.5518494	+508	+0.7737280	+0.7780828	−458	+0.3356488	+0.3375381	+209
18	0.5447633	0.5376387	520	0.7823824	0.7866264	455	0.3394033	0.3412445	216
19	0.5304758	0.5232752	531	0.7908148	0.7949469	452	0.3430612	0.3448538	222
20	0.5160375	0.5087627	543	0.7990230	0.8030423	449	0.3466217	0.3483653	228
21	0.5014519	0.4941051	555	0.8070048	0.8109102	446	0.3500839	0.3517780	234
22	+0.4867231	+0.4793064	+566	+0.8147581	+0.8185483	−442	+0.3534470	+0.3550910	+240
23	0.4718553	0.4643707	578	0.8222806	0.8259546	438	0.3567098	0.3583033	246
24	0.4568526	0.4493019	589	0.8295701	0.8331268	433	0.3598714	0.3614140	252
25	0.4417187	0.4341038	601	0.8366245	0.8400629	429	0.3629310	0.3644223	258
26	0.4264575	0.4187805	612	0.8434419	0.8467610	424	0.3658878	0.3673272	264
27	+0.4110733	+0.4033365	+624	+0.8500201	+0.8532188	−419	+0.3687407	+0.3701279	+270
28	0.3955707	0.3877763	635	0.8563569	0.8594341	413	0.3714888	0.3728234	277
29	0.3799541	0.3721046	647	0.8624501	0.8654048	407	0.3741314	0.3754130	283
30	0.3642263	0.3563260	658	0.8682978	0.8711290	401	0.3766677	0.3778958	289
31	0.3483981	0.3404453	669	0.8738982	0.8766050	395	0.3790969	0.3802710	295
June 1	+0.3324682	+0.3244673	+680	+0.8792494	+0.8818310	−388	+0.3814180	+0.3825378	+302
2	0.3164433	0.3083966	692	0.8843498	0.8868056	381	0.3836304	0.3846958	308
3	0.3003280	0.2922381	703	0.8891981	0.8915274	374	0.3857338	0.3867444	314
4	0.2841272	0.2759964	714	0.8937931	0.8959953	366	0.3877275	0.3886829	320
5	0.2678465	0.2596780	725	0.8981336	0.9002081	358	0.3896108	0.3905109	327
6	+0.2514911	+0.2432868	+736	+0.9022185	+0.9041649	−350	+0.3913834	+0.3922279	+333
7	0.2350656	0.2268279	747	0.9060469	0.9078648	341	0.3930448	0.3938335	339
8	0.2185746	0.2103061	758	0.9096180	0.9113069	332	0.3945946	0.3953275	345
9	0.2020230	0.1937261	768	0.9129311	0.9144907	323	0.3960326	0.3967095	352
10	0.1854159	0.1770930	778	0 9159857	0.9174159	313	0.3973584	0.3979792	358
11	+0.1687583	+0.1604117	+788	+0.9187815	+0.9200824	−303	+0.3985719	+0.3991365	+364
12	0.1520545	0.1436866	798	0.9213185	0.9224808	293	0.3996730	0.4001813	370
13	0.1353088	0.1269220	808	0.9235962	0.9246377	282	0.4006615	0.4011135	376
14	0.1185265	0.1101227	818	0.9256142	0.9265257	271	0.4015372	0.4019328	382
15	0.1017114	0.0932933	827	0.9273722	0.9281536	259	0.4023000	0.4026390	388
16	+0.0848687	+0.0764382	+836	+0.9288698	+0.9295210	−248	+0.4029497	+0.4032321	+394
17	0.0680022	0.0595614	845	0.9301069	0.9306277	236	0.4034863	0.4037120	400
18	0.0511162	0.0426673	854	0.9310832	0.9314735	224	0.4039095	0.4040786	406
19	0.0342153	0.0257607	862	0.9317985	0.9320581	211	0.4042193	0.4043317	412
20	0.0173040	+0.0088459	871	0.9322524	0.9323813	198	0.4044157	0.4044713	418
21	+0.0003868	−0.0080726	+879	+0.9324447	+0.9324427	−184	+0.4044986	+0.4044974	+424
22	−0.0165317	0.0249901	887	0.9323752	0.9322422	170	0.4044678	0.4044098	430
23	0.0334472	0.0419023	894	0.9320437	0.9317796	156	0.4043233	0.4042084	436
24	0.0503550	0.0588044	902	0.9314499	0.9310545	142	0.4040650	0.4038932	442
25	0.0672501	0.0756913	909	0.9305934	0.9300666	127	0.4036929	0.4034642	447
26	−0.0841275	−0.0925581	+916	+0.9294741	+0.9288159	−112	+0.4032070	+0.4029213	+453
27	0.1009825	0.1094001	922	0.9280920	0.9273026	97	0.4026071	0.4022645	458
28	0.1178103	0.1262125	929	0.9264475	0.9255270	82	0.4018934	0.4014941	464
29	0.1346060	0.1429902	935	0.9245409	0.9234895	66	0.4010663	0.4006103	469
30	0.1513645	0.1597281	941	0.9223725	0.9211904	50	0.4001258	0.3996132	475
31	−0.1680805	−0.1764208	+946	+0.9199428	+0.9186303	− 34	+0.3990721	+0.3985030	+480
32	−0.1847486	−0.1930631	+951	+0.9172525	+0.9158100	− 18	+0.3979055	+0.3972801	+485

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
July 1	−0.1680805	−0.1764208	+946	+0.9199428	+0.9186303	− 34	+0.3990721	+0.3985030	+480
2	0.1847486	0.1930631	951	0.9172525	0.9158100	18	0.3979055	0.3972801	485
3	0.2013638	0.2096500	956	0.9143025	0.9127304	− 1	0.3966264	0.3959449	490
4	0.2179213	0.2261770	960	0.9110937	0.9093926	+ 16	0.3952352	0.3944978	495
5	0.2344167	0.2426396	964	0.9076273	0.9057979	33	0.3937323	0.3929392	500
6	−0.2508452	−0.2590327	+968	+0.9039046	+0.9019476	+ 50	+0.3921182	+0.3912697	+505
7	0.2672015	0.2753511	971	0.8999269	0.8978429	68	0.3903935	0.3894898	509
8	0.2834807	0.2915900	974	0.8956956	0.8934853	86	0.3885586	0.3876002	514
9	0.2996782	0.3077450	977	0.8912122	0.8888766	104	0.3866143	0.3856015	518
10	0.3157896	0.3238118	979	0.8864786	0.8840185	122	0.3845614	0.3834945	524
11	−0.3318107	−0.3397862	+981	+0.8814965	+0.8789127	+140	+0.3824005	+0.3812798	+528
12	0.3477375	0.3556642	982	0.8762673	0.8735605	158	0.3801323	0.3789582	533
13	0.3635658	0.3714417	983	0.8707925	0.8679635	177	0.3777574	0.3765302	537
14	0.3792013	0.3871143	984	0.8650738	0.8621235	196	0.3752764	0.3739965	542
15	0.3949099	0.4026779	984	0.8591127	0.8560419	215	0.3726902	0.3713580	546
16	−0.4104175	−0.4181285	+984	+0.8529109	+0.8497204	+234	+0.3699996	+0.3686154	+551
17	0.4258100	0.4334619	983	0.8464702	0.8431608	253	0.3672052	0.3657693	555
18	0.4410834	0.4486742	982	0.8397921	0.8363645	272	0.3643077	0.3628205	559
19	0.4562336	0.4637613	980	0.8328781	0.8293331	292	0.3613077	0.3597696	563
20	0.4712565	0.4787189	978	0.8257297	0.8220682	311	0.3582061	0.3566175	567
21	−0.4861479	−0.4935430	+975	+0.8183487	+0.8145716	+331	+0.3550036	+0.3533649	+571
22	0.5009037	0.5082296	972	0.8107369	0.8068450	351	0.3517011	0.3500125	575
23	0.5155198	0.5227740	969	0.8028960	0.7988901	371	0.3482992	0.3465612	578
24	0.5299919	0.5371728	965	0.7948276	0.7907087	391	0.3447988	0.3430118	582
25	0.5443157	0.5514206	961	0.7865336	0.7823026	411	0.3412006	0.3393651	585
26	−0.5584866	−0.5655133	+956	+0.7780159	+0.7736739	+431	+0.3375056	+0.3356221	+589
27	0.5725001	0.5794465	951	0.7692768	0.7648250	451	0.3337148	0.3317837	592
28	0.5863519	0.5932158	945	0.7603187	0.7557583	471	0.3298291	0.3278509	595
29	0.6000377	0.6068170	939	0.7511441	0.7464764	491	0.3258495	0.3238248	598
30	0.6135532	0.6202458	933	0.7417555	0.7369818	511	0.3217773	0.3197067	601
31	−0.6268942	−0.6334980	+926	+0.7321556	+0.7272774	+531	+0.3176135	+0.3154976	+604
Aug. 1	0.6400567	0.6465697	919	0.7223473	0.7173659	551	0.3133593	0.3111987	607
2	0.6530367	0.6594569	911	0.7123334	0.7072504	571	0.3090160	0.3068114	610
3	0.6658301	0.6721556	903	0.7021171	0.6969341	591	0.3045849	0.3023370	613
4	0.6784330	0.6846619	894	0.6917016	0.6864202	610	0.3000674	0.2977767	615
5	−0.6908418	−0.6969723	+885	+0.6810902	+0.6757120	+630	+0.2954648	+0.2931320	+618
6	0.7030529	0.7090834	875	0.6702860	0.6648126	649	0.2907784	0.2884043	620
7	0.7150632	0.7209921	865	0.6592921	0.6537252	669	0.2860096	0.2835948	622
8	0.7268695	0.7326952	854	0.6481120	0.6424534	688	0.2811598	0.2787051	624
9	0.7384686	0.7441894	843	0.6367494	0.6310006	707	0.2762307	0.2737368	626
10	−0.7498571	−0.7554715	+832	+0.6252074	+0.6193699	+726	+0.2712236	+0.2686912	+628
11	0.7610320	0.7665385	820	0.6134888	0.6075644	745	0.2661398	0.2635696	630
12	0.7719905	0.7773877	808	0.6015970	0.5955873	764	0.2609808	0.2583735	631
13	0.7827298	0.7880162	795	0.5895354	0.5834420	783	0.2557480	0.2531043	633
14	0.7932468	0.7984212	782	0.5773074	0.5711319	801	0.2504428	0.2477635	634
15	−0.8035389	−0.8085998	+769	+0.5649160	+0.5586599	+819	+0.2450666	+0.2423524	+635
16	−0.8136035	−0.8185495	+755	+0.5523640	+0.5460288	+837	+0.2396209	+0.2368724	+636

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Aug. 16	−0.8136035	−0.8185495	+755	+0.5523640	+0.5460288	+ 837	+0.2396209	+0.2368724	+636
17	0.8234376	0.8282672	741	0.5396546	0.5332419	855	0.2341070	0.2313249	637
18	0.8330380	0.8377497	726	0.5267911	0.5203028	872	0.2285262	0.2257113	637
19	0.8424018	0.8469942	711	0.5137773	0.5072150	890	0.2228801	0.2200331	637
20	0.8515263	0.8559980	696	0.5006163	0.4939815	907	0.2171702	0.2142919	638
21	−0.8604086	−0.8647580	+680	+0.4873111	+0.4806055	+ 924	+0.2113981	+0.2084891	+638
22	0.8690457	0.8732714	664	0.4738651	0.4670905	941	0.2055651	0.2026262	638
23	0.8774347	0.8815353	648	0.4602819	0.4534401	958	0.1996727	0.1967048	638
24	0.8855729	0.8895469	631	0.4465654	0.4396585	974	0.1937226	0.1907265	638
25	0.8934571	0.8973031	614	0.4327196	0.4257495	990	0.1877166	0.1846931	638
26	−0.9010846	−0.9048012	+596	+0.4187483	+0.4117168	+1006	+0.1816563	+0.1786062	+638
27	0.9084526	0.9120386	578	0.4046552	0.3975642	1021	0.1755432	0.1724674	638
28	0.9155587	0.9190128	560	0.3904442	0.3832959	1036	0.1693790	0.1662784	637
29	0.9224002	0.9257211	541	0.3761197	0.3689163	1051	0.1631656	0.1600411	636
30	0.9289747	0.9321613	522	0.3616863	0.3544301	1065	0.1569050	0.1537576	635
31	−0.9352802	−0.9383314	+503	+0.3471485	+0.3398418	+1079	+0.1505991	+0.1474298	+634
Sept. 1	0.9413146	0.9442295	483	0.3325107	0.3251558	1093	0.1442498	0.1410595	633
2	0.9470760	0.9498537	463	0.3177776	0.3103768	1107	0.1378590	0.1346487	632
3	0.9525626	0.9552023	443	0.3029539	0.2955094	1120	0.1314286	0.1281993	630
4	0.9577728	0.9602738	423	0.2880438	0.2805576	1133	0.1249606	0.1217131	629
5	−0.9627051	−0.9650667	+402	+0.2730514	+0.2655257	+1145	+0.1184568	+0.1151921	+627
6	0.9673582	0.9695798	381	0.2579811	0.2504183	1157	0.1119191	0.1086382	625
7	0.9717311	0.9738122	359	0.2428376	0.2352399	1169	0.1053495	0.1020534	623
8	0.9758228	0.9777629	338	0.2276255	0.2199950	1180	0.0987500	0.0954396	621
9	0.9796322	0.9814307	316	0.2123490	0.2046878	1191	0.0921224	0.0887987	618
10	−0.9831582	−0.9848146	+294	+0.1970122	+0.1893225	+1202	+0.0854685	+0.0821324	+615
11	0.9863998	0.9879135	272	0.1816194	0.1739033	1212	0.0787903	0.0754427	612
12	0.9893558	0.9907265	250	0.1661748	0.1584344	1222	0.0720896	0.0687314	609
13	0.9920254	0.9932527	227	0.1506825	0.1429198	1231	0.0653682	0.0620003	606
14	0.9944080	0.9954915	204	0.1351465	0.1273634	1240	0.0586279	0.0552512	603
15	−0.9965028	−0.9974421	+181	+0.1195708	+0.1117694	+1249	+0.0518705	+0.0484859	+599
16	0.9983089	0.9991034	158	0.1039596	0.0961421	1258	0.0450977	0.0417062	596
17	0.9998252	1.0004744	135	0.0883174	0.0804860	1266	0.0383115	0.0349141	592
18	1.0010507	1.0015542	112	0.0726485	0.0648054	1274	0.0315140	0.0281117	588
19	1.0019845	1.0023419	88	0.0569572	0.0491047	1281	0.0247071	0.0213007	584
20	−1.0026259	−1.0028367	+ 64	+0.0412481	+0.0333882	+1288	+0.0178924	+0.0144828	+580
21	1.0029739	1.0030377	40	0.0255254	0.0176603	1295	0.0110719	0.0076601	575
22	1.0030277	1.0029441	+ 16	+0.0097934	+0.0019254	1301	+0.0042476	+0.0008346	571
23	1.0027866	1.0025555	− 9	−0.0059434	−0.0138118	1307	−0.0025786	−0.0059916	566
24	1.0022504	1.0018716	33	0.0216798	0.0295461	1313	0.0094045	0.0128165	561
25	−1.0014189	−1.0008923	− 58	−0.0374105	−0.0452723	+1318	−0.0162279	−0.0196380	+556
26	1.0002919	0.9996174	83	0.0531307	0.0609855	1323	0.0230468	0.0264540	551
27	0.9988691	0.9980466	108	0.0688359	0.0766813	1227	0.0298592	0.9332623	546
28	0.9971503	0.9961800	133	0.0845212	0.0923547	1331	0.0366630	0.0400609	541
29	0.9951358	0.9940180	158	0.1001814	0.1080004	1335	0.0434560	0.0468477	535
30	−0.9928263	−0.9915612	−183	−0.1158112	−0.1236132	+1338	−0.0502360	−0.0536204	+529
31	−0.9902224	−0.9888104	−208	−0.1314058	−0.1391884	+1341	−0.0570009	−0.0603770	+523

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Oct. 1	–0.9902224	–0.9888104	– 208	–0.1314058	–0.1391884	+1341	–0.0570009	–0.0603770	+523
2	0.9873249	0.9857664	233	0.1469604	0.1547212	1344	0.0637486	0.0671153	517
3	0.9841348	0.9824303	259	0.1624701	0.1702067	1346	0.0704770	0.0738333	511
4	0.9806531	0.9788032	284	0.1779302	0.1856403	1347	0.0771841	0.0805290	504
5	0.9768809	0.9748861	310	0.1933362	0.2010175	1248	0.0838678	0.0872003	497
6	–0.9728191	–0.9706800	– 335	–0.2086836	–0.2163339	+1349	–0.0905261	–0.0938452	+491
7	0.9684690	0.9661864	361	0.2239678	0.2315848	1349	0.0971571	0.1004618	484
8	0.9638323	0.9614070	386	0.2391842	0.2467656	1349	0.1037588	0.1070480	477
9	0.9589106	0.9563433	412	0.2543283	0.2618720	1348	0.1103292	0.1136020	470
10	0.9537052	0.9509965	437	0.2693959	0.2768999	1347	0.1168664	0.1201220	463
11	–0.9482173	–0.9453679	– 463	–0.2843832	–0.2918454	+1346	–0.1233687	–0.1266062	+455
12	0.9424485	0.9394592	488	0.2992860	0.3067042	1344	0.1298343	0.1330526	447
13	0.9364005	0.9332719	514	0.3140997	0.3214718	1342	0.1362611	0.1394594	439
14	0.9300742	0.9268071	540	0.3288201	0.3361442	1340	0.1426473	0.1458247	431
15	0.9234709	0.9200660	566	0.3434433	0.3507174	1337	0.1489912	0.1521468	423
16	–0.9165923	–0.9130503	– 591	–0.3579655	–0.3651873	+1334	–0.1552911	–0.1584239	+415
17	0.9094401	0.9057619	617	0.3723822	0.3795494	1330	0.1615449	0.1646539	406
18	0.9020160	0.8982025	642	0.3866885	0.3937990	1326	0.1677507	0.1708350	397
19	0.8943217	0.8903737	668	0.4008800	0.4079316	1321	0.1739067	0.1769654	388
20	0.8863587	0.8822768	693	0.4149527	0.4219432	1316	0.1800111	0.1830433	379
21	–0.8781284	–0.8739135	– 719	–0.4289023	–0.4358295	+1311	–0.1860620	–0.1890667	+370
22	0.8696326	0.8652859	744	0.4427242	0.4495859	1306	0.1920574	0.1950336	361
23	0.8608738	0.8563966	770	0.4564137	0.4632076	1300	0.1979953	0.2009421	351
24	0.8518546	0.8472481	795	0.4699664	0.4766901	1294	0.2038738	0.2067903	342
25	0.8425774	0.8378428	821	0.4833777	0.4900290	1287	0.2096911	0.2125762	332
26	–0.8330445	–0.8281831	– 846	–0.4966431	–0.5032198	+1280	–0.2154452	–0.2182980	+322
27	0.8232586	0.8182718	872	0.5097583	0.5162581	1272	0.2211342	0.2239538	312
28	0.8132227	0.8081120	897	0.5227188	0.5291395	1264	0.2267563	0.2295416	302
29	0.8029397	0.7977066	922	0.5355199	0.5418596	1255	0.2323095	0.2350597	292
30	0.7924128	0.7870590	947	0.5481578	0.5544143	1246	0.2377919	0.2405061	282
31	–0.7816454	–0.7761727	– 972	–0.5606284	–0.5667996	+1237	–0.2432018	–0.2458792	+271
Nov. 1	0.7706410	0.7650511	997	0.5729275	0.5790115	1227	0.2485376	0.2511772	261
2	0.7594032	0.7536979	1021	0.5850513	0.5910463	1217	0.2537975	0.2563985	250
3	0.7479355	0.7421166	1046	0.5969961	0.6029003	1206	0.2589798	0.2615414	239
4	0.7362415	0.7303108	1070	0.6087584	0.6145700	1195	0.2640829	0.2666044	228
5	–0.7243249	–0.7182842	–1095	–0.6203347	–0.6260520	+1183	–0.2691054	–0.2715860	+217
6	0.7121893	0.7060406	1119	0.6317215	0.6373429	1171	0.2740458	0.2764848	206
7	0.6998385	0.6935837	1143	0.6429156	0.6484394	1159	0.2789026	0.2812992	195
8	0.6872764	0.6809173	1167	0.6539138	0.6593385	1146	0.2836743	0.2860278	183
9	0.6745065	0.6680448	1191	0.6647130	0.6700371	1133	0.2883595	0.2906693	172
10	–0.6615323	–0.6549699	–1214	–0.6753101	–0.6805319	+1119	–0.2929569	–0.2952223	+160
11	0.6483576	0.6416963	1238	0.6857018	0.6908197	1105	0.2974651	0.2996854	148
12	0.6349862	0.6282278	1261	0.6958851	0.7008977	1090	0.3018828	0.3040573	136
13	0.6214215	0.6145678	1284	0.7058572	0.7107631	1075	0.3062087	0.3083367	124
14	0.6076670	0.6007198	1306	0.7156150	0.7204126	1059	0.3104413	0.3125223	112
15	–0.5937264	–0.5866876	–1329	–0.7251553	–0.7298430	+1043	–0.3145794	–0.3166127	+100
16	–0.5796035	–0.5724750	–1351	–0.7344750	–0.7390512	+1027	–0.3186218	–0.3206067	+ 88

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Nov. 16	−0.5796035	−0.5724750	−1351	−0.7344750	−0.7390512	+1027	−0.3186218	−0.3206067	+ 88
17	0.5653021	0.5580860	1373	0.7435711	0.7480343	1010	0.3225672	0.3245031	76
18	0.5508265	0.5435247	1395	0.7524405	0.7567892	993	0.3264141	0.3283003	63
19	0.5361807	0.5287953	1417	0.7610802	0.7653128	976	0.3301612	0.3319970	51
20	0.5213688	0.5139019	1438	0.7694868	0.7736016	958	0.3338072	0.3355919	38
21	−0.5063950	−0.4988489	−1459	−0.7776570	−0.7816525	+ 939	−0.3373508	−0.3390838	+ 25
22	0.4912639	0.4836409	1480	0.7855877	0.7894625	920	0.3407907	0.3424715	+ 12
23	0.4759802	0.4682826	1501	0.7932764	0.7970293	901	0.3441258	0.3457537	− 1
24	0.4605486	0.4527788	1521	0.8007207	0.8043503	881	0.3473549	0.3489293	14
25	0.4449737	0.4371342	1541	0.8079178	0.8114226	861	0.3504767	0.3519971	27
26	−0.4292605	−0.4213539	−1560	−0.8148646	−0.8182434	+ 840	−0.3534902	−0.3549560	− 40
27	0.4134144	0.4054433	1579	0.8215586	0.8248102	819	0.3563941	0.3578049	53
28	0.3974407	0.3894077	1598	0.8279977	0.8311209	797	0.3591876	0.3605428	66
29	0.3813446	0.3732523	1617	0.8341797	0.8371736	775	0.3618698	0.3631690	79
30	0.3651311	0.3569821	1635	0.8401026	0.8429664	752	0.3644399	0.3656826	92
Dec. 1	−0.3488054	−0.3406024	−1653	−0.8457648	−0.8484975	+ 729	−0.3668969	−0.3680827	− 105
2	0.3323731	0.3241188	1671	0.8511644	0.8537653	705	0.3692400	0.3703686	119
3	0.3158397	0.3075367	1688	0.8562999	0.8587684	681	0.3714685	0.3725396	132
4	0.2992103	0.2908613	1705	0.8611702	0.8635055	656	0.3735819	0.3745952	145
5	0.2824900	0.2740974	1721	0.8657739	0.8679754	631	0.3755796	0.3765349	158
6	−0.2656837	−0.2572499	−1737	−0.8701098	−0.8721770	+ 606	−0.3774611	−0.3783581	− 172
7	0.2487964	0.2403241	1753	0.8741768	0.8761092	580	0.3792258	0.3800642	185
8	0.2318336	0.2233254	1768	0.8779739	0.8797710	554	0.3808732	0.3816528	199
9	0.2148003	0.2062587	1783	0.8815000	0.8831612	527	0.3824030	0.3831235	212
10	0.1977013	0.1891287	1797	0.8847541	0.8862788	500	0.3838146	0.3844759	226
11	−0.1805413	−0.1719401	−1811	−0.8877351	−0.8891229	+ 472	−0.3851076	−0.3857095	− 239
12	0.1633254	0.1546981	1824	0.8904423	0.8916929	444	0.3862816	0.3868240	253
13	0.1460588	0.1374079	1837	0.8928748	0.8939877	416	0.3873364	0.3878190	267
14	0.1287462	0.1200742	1850	0.8950315	0.8960060	387	0.3882715	0.3886940	281
15	0.1113924	0.1027019	1862	0.8969115	0.8977475	358	0.3890864	0.3894486	295
16	−0.0940028	−0.0852963	−1873	−0.8985138	−0.8992105	+ 329	−0.3897806	−0.3900825	− 308
17	0.0765826	0.0678627	1884	0.8998377	0.9003951	299	0.3903541	0.3905956	322
18	0.0591370	0.0504065	1894	0.9008826	0.9013002	269	0.3908068	0.3909877	335
19	0.0416716	0.0329332	1904	0.9016478	0.9019251	238	0.3911384	0.3912584	349
20	0.0241918	−0.0154482	1913	0.9021322	0.9022689	208	0.3913482	0.3914073	362
21	−0.0067028	+0.0020433	−1921	−0.9023352	−0.9023312	+ 177	−0.3914360	−0.3914341	− 375
22	+0.0107897	0.0195355	1929	0.9022567	0.9021118	146	0.3914018	0.3913389	388
23	0.0282800	0.0370225	1936	0.9018965	0.9016106	114	0.3912455	0.3911216	401
24	0.0457623	0.0544986	1943	0.9012544	0.9008275	82	0.3909671	0.3907821	415
25	0.0632308	0.0719580	1949	0.9003303	0.8997626	50	0.3905665	0.3903205	428
26	+0.0806796	+0.0893947	−1954	−0.8991245	−0.8984162	+ 17	−0.3900438	−0.3897369	− 441
27	0.0981027	0.1068029	1958	0.8976375	0.8967888	− 16	0.3893993	0.3890314	454
28	0.1154945	0.1241768	1962	0.8958697	0.8948808	50	0.3886331	0.3882044	467
29	0.1328492	0.1415109	1965	0.8938218	0.8926931	83	0.3877454	0.3872561	480
30	0.1501613	0.1587997	1968	0.8914947	0.8902267	117	0.3867366	0.3861870	492
31	+0.1674254	+0.1760378	−1970	−0.8888896	−0.8874829	− 151	−0.3856072	−0.3849975	− 505
32	+0.1846360	+0.1932195	−1971	−0.8860073	−0.8844628	− 185	−0.3843577	−0.3836881	− 517

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JANUARY.		Day of Month.	FEBRUARY.		Day of Month.	MARCH.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	238° 25′ 22″.2	+4° 43′ 12″.5	1.0	284° 5′ 6″.9	+4° 36′ 28″.7	1.0	292° 51′ 43″.5	+4° 15′ 10″.3
1.5	244 37 35.7	4 53 0.4	1.5	290 1 33.0	4 20 12.1	1.5	298 46 17.9	3 54 22.2
2.0	250 47 25.0	4 59 18.2	2.0	295 57 8.1	4 1 8.2	2.0	304 40 23.3	3 31 5.7
2.5	256 55 1.5	5 2 5.6	2.5	301 52 6.8	3 39 29.3	2.5	310 34 23.4	3 5 34.1
3.0	263 0 35.2	5 1 24.3	3.0	307 46 43.1	3 15 28.6	3.0	316 28 40.5	2 38 1.9
3.5	269 4 14.7	+4 57 17.9	3.5	313 41 10.2	+2 49 20.7	3.5	322 23 35.0	+2 8 44.4
4.0	275 6 8.2	4 49 51.9	4.0	319 35 41.7	2 21 21.1	4.0	328 19 25.4	1 37 58.5
4.5	281 6 23.2	4 39 13.6	4.5	325 30 31.6	1 51 46.5	4.5	334 16 28.8	1 6 1.9
5.0	287 5 7.8	4 25 31.9	5.0	331 25 54.4	1 20 54.5	5.0	340 15 1.2	+0 33 13.6
5.5	293 2 30.7	4 8 57.1	5.5	337 22 5.8	0 49 3.4	5.5	346 15 17.1	—0 0 6.4
6.0	298 58 42.3	+3 49 41.1	6.0	343 19 23.0	+0 16 32.2	6.0	352 17 30.1	—0 33 37.3
6.5	304 53 54.2	3 27 57.0	6.5	349 18 4.4	—0 16 19.5	6.5	358 21 53.1	1 6 57.3
7.0	310 48 20.3	3 3 58.7	7.0	355 18 30.3	0 49 11.6	7.0	4 28 38.6	1 39 43.9
7.5	316 42 16.9	2 38 1.0	7.5	1 21 2.9	1 21 43.7	7.5	10 37 59.0	2 11 34.5
8.0	322 36 3.1	2 10 19.5	8.0	7 26 6.1	1 53 34.8	8.0	16 50 6.4	2 42 6.1
8.5	328 30 0.4	+1 41 10.3	8.5	13 34 5.7	—2 24 23.8	8.5	23 5 13.1	—3 10 55.8
9.0	334 24 33.3	1 10 49.9	9.0	19 45 28.4	2 53 49.2	9.0	29 23 31.7	3 37 40.8
9.5	340 20 9.7	0 39 35.5	9.5	26 0 42.4	3 21 29.1	9.5	35 45 14.9	4 1 59.0
10.0	346 17 19.7	+0 7 44.6	10.0	32 20 16.1	3 47 1.3	10.0	42 10 35.9	4 23 28.7
10.5	352 16 35.9	—0 24 24.7	10.5	38 44 37.8	4 10 3.6	10.5	48 39 47.6	4 41 49.3
11.0	358 18 33.6	—0 56 33.7	11.0	45 14 15.1	—4 30 13.3	11.0	55 13 2.8	—4 56 41.5
11.5	4 23 49.5	1 28 23.0	11.5	51 49 33.0	4 47 8.2	11.5	61 50 33.5	5 7 47.4
12.0	10 33 1.4	1 59 32.1	12.0	58 30 53.2	5 0 26.2	12.0	68 32 30.6	5 14 50.9
12.5	16 46 48.1	2 29 39.8	12.5	65 18 33.1	5 9 46.1	12.5	75 19 3.0	5 17 38.1
13.0	23 5 47.3	2 58 23.6	13.0	72 12 44.4	5 14 48.5	13.0	82 10 17.1	5 15 57.8
13.5	29 30 35.2	—3 25 19.5	13.5	79 13 31.0	—5 15 16.6	13.5	89 6 15.9	—5 9 42.2
14.0	36 1 45.7	3 50 2.7	14.0	86 20 48.1	5 10 56.4	14.0	96 6 58.3	4 58 47.3
14.5	42 39 47.7	4 12 7.1	14.5	93 34 20.9	5 1 38.7	14.5	103 12 17.9	4 43 13.7
15.0	49 25 4.4	4 31 6.0	15.0	100 53 43.8	4 47 20.5	15.0	110 22 2.6	4 23 7.1
15.5	56 17 50.9	4 46 32.4	15.5	108 18 20.2	4 28 5.5	15.5	117 35 53.9	3 58 38.9
16.0	63 18 12.8	—4 58 0.4	16.0	115 47 22.4	—4 4 5.1	16.0	124 53 26.3	—3 30 7.2
16.5	70 26 4.3	5 5 5.4	16.5	123 19 52.9	3 35 39.2	16.5	132 14 7.2	2 57 56.2
17.0	77 41 6.9	5 7 26.5	17.0	130 54 46.1	3 3 16.2	17.0	139 37 17.2	2 22 36.4
17.5	85 2 48.2	5 4 47.0	17.5	138 30 50.2	2 27 32.3	17.5	147 2 10.5	1 44 44.4
18.0	92 30 22.1	4 56 56.7	18.0	146 6 51.0	1 49 10.0	18.0	154 27 56.3	1 5 1.9
18.5	100 2 50.0	—4 43 53.1	18.5	153 41 33.3	—1 8 56.9	18.5	161 53 40.1	—0 24 13.8
19.0	107 39 1.6	4 25 42.5	19.0	161 13 45.6	—0 27 42.9	19.0	169 18 25.0	+0 16 52.9
19.5	115 17 38.5	4 2 40.5	19.5	168 42 21.5	+0 13 41.3	19.5	176 41 14.1	0 57 30.8
20.0	122 57 17.0	3 35 12.0	20.0	176 6 22.6	0 54 27.4	20.0	184 1 12.2	1 36 54.6
20.5	130 36 32.1	3 3 50.3	20.5	183 25 0.3	1 33 50.9	20.5	191 17 28.0	2 14 22.4
21.0	138 14 1.6	—2 29 15.7	21.0	190 37 36.2	+2 11 11.7	21.0	198 29 15.3	+2 49 16.9
21.5	145 48 29.1	1 52 13.2	21.5	197 43 43.0	2 45 56.6	21.5	205 35 55.4	3 21 6.7
22.0	153 18 47.4	1 13 30.8	22.0	204 43 4.1	3 17 38.6	22.0	212 36 56.8	3 49 27.1
22.5	160 44 0.7	—0 33 56.5	22.5	211 35 32.8	3 45 56.7	22.5	219 31 56.9	4 13 59.5
23.0	168 3 25.0	+0 5 43.3	23.0	218 21 11.9	4 10 36.1	23.0	226 20 41.8	4 34 31.4
23.5	175 16 29.2	+0 44 45.5	23.5	225 0 11.9	+4 31 27.2	23.5	233 3 6.4	+4 50 56.2
24.0	182 22 54.5	1 22 31.5	24.0	231 32 49.7	4 48 24.7	24.0	239 39 13.4	5 3 12.1
24.5	189 22 33.0	1 58 27.8	24.5	237 59 27.7	5 1 26.8	24.5	246 9 13.0	5 11 21.1
25.0	196 15 26.7	2 32 6.2	25.0	244 20 32.5	5 10 35.0	25.0	252 33 22.0	5 15 28.5
25.5	203 1 45.7	3 3 3.8	25.5	250 36 33.3	5 15 52.9	25.5	258 52 2.8	5 15 42.1
26.0	209 41 46.6	+3 31 2.3	26.0	256 48 1.6	+5 17 25.7	26.0	265 5 42.2	+5 12 11.3
26.5	216 15 50.8	3 55 47.8	26.5	262 55 30.1	5 15 19.8	26.5	271 14 50.7	5 5 6.8
27.0	222 44 23.4	4 17 10.0	27.0	268 59 31.3	5 9 43.2	27.0	277 20 1.5	4 54 39.9
27.5	229 7 51.3	4 35 2.0	27.5	275 0 38.1	5 0 44.4	27.5	283 21 49.7	4 41 2.8
28.0	235 26 42.8	4 49 19.4	28.0	280 59 22.1	4 48 32.5	28.0	289 20 51.5	4 24 27.8
28.5	241 41 26.3	4 59 59.9	28.5	286 56 14.1	4 33 17.6	28.5	295 17 43.6	4 5 7.5
29.0	247 52 29.7	+5 7 3.5	29.0	292 51 43.5	+4 15 10.3	29.0	301 13 2.7	+3 43 14.8
29.5	254 0 20.1	5 10 31.5	29.5	298 46 17.9	3 54 22.2	29.5	307 7 24.7	3 19 3.0
30.0	260 5 22.9	5 10 26.9	30.0	304 40 23.3	3 31 5.7	30.0	313 1 24.6	2 52 45.9
30.5	266 8 1.8	5 6 54.0	30.5	310 34 23.4	3 5 34.1	30.5	318 55 36.0	2 24 37.9
31.0	272 8 39.0	4 59 58.6	31.0	316 28 40.5	2 38 1.9	31.0	324 50 30.8	1 54 54.0
31.5	278 7 34.6	+4 49 47.4	31.5	322 23 35.0	+2 8 44.4	31.5	330 46 38.1	+1 23 50.5

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	APRIL.		Day of Month.	MAY.		Day of Month.	JUNE.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	336° 44′ 25″.5	+0° 51′ 44″.4	1.0	9° 17′ 53″.4	—2° 6′ 52″.4	1.0	56° 51′ 1″.3	—4° 50′ 30″.6
1.5	342 44 17.6	+0 18 54.3	1.5	15 35 20.0	2 36 42.2	1.5	63 46 10.2	4 57 45.2
2.0	348 46 36.0	—0 14 20.2	2.0	21 57 20.2	3 4 54.0	2.0	70 46 11.6	5 0 37.5
2.5	354 51 39.7	0 47 38.3	2.5	28 24 1.3	3 31 2.9	2.5	77 50 30.7	4 58 56.1
3.0	0 59 44.5	1 20 37.9	3.0	34 55 24.6	3 54 43.6	3.0	84 58 26.6	4 52 35.0
3.5	7 11 2.9	—1 52 56.0	3.5	41 31 25.5	—4 15 31.4	3.5	92 9 14.0	4 41 34.2
4.0	13 25 44.7	2 24 8.5	4.0	48 11 54.4	4 33 2.9	4.0	99 22 5.5	4 26 0.6
4.5	19 43 56.3	2 53 51.2	4.5	54 56 35.9	4 46 56.8	4.5	106 36 13.4	4 6 7.2
5.0	26 5 41.6	3 21 39.4	5.0	61 45 10.1	4 56 54.3	5.0	113 50 51.3	3 42 13.2
5.5	32 31 1.8	3 47 8.9	5.5	68 37 13.4	5 2 40.1	5.5	121 5 16.6	3 14 43.3
6.0	38 59 55.6	—4 9 56.2	6.0	75 32 19.9	—5 4 2.9	6.0	128 18 51.4	—2 44 6.9
6.5	45 32 20.1	4 29 39.1	6.5	82 30 1.8	5 0 56.7	6.5	135 31 3.5	2 10 56.9
7.0	52 8 10.5	4 45 57.0	7.0	89 29 51.0	4 53 19.9	7.0	142 41 27.0	1 35 48.6
7.5	58 47 21.2	4 58 31.7	7.5	96 31 20.4	4 41 15.7	7.5	149 49 42.0	0 59 18.7
8.0	65 29 45.7	5 7 7.6	8.0	103 34 4.4	4 24 53.3	8.0	156 55 34.3	—0 22 4.4
8.5	72 15 17.0	−5 11 31.9	8.5	110 37 39.9	—4 4 26.2	8.5	163 58 54.9	+0 15 17.9
9.0	79 3 48.2	5 11 35.6	9.0	117 41 47.1	3 40 12.7	9.0	170 59 38.8	0 52 12.8
9.5	85 55 12.4	5 7 13.1	9.5	124 46 9.3	3 12 35.1	9.5	177 57 43.8	1 28 6.4
10.0	92 49 22.6	4 58 22.9	10.0	131 50 32.5	2 41 59.4	10.0	184 53 9.7	2 2 27.4
10.5	99 46 12.0	4 45 7.5	10.5	138 54 45.4	2 8 54.8	10.5	191 45 57.2	2 34 46.9
11.0	106 45 33.6	—4 27 33.9	11.0	145 58 39.1	—1 33 52.6	11.0	198 36 7.2	+3 4 38.9
11.5	113 47 19.6	4 5 53.2	11.5	153 2 5.9	0 57 26.5	11.5	205 23 39.9	3 31 40.5
12.0	120 51 21.2	3 40 21.6	12.0	160 4 58.4	−0 20 11.3	12.0	212 8 34.3	3 55 32.1
12.5	127 57 28.2	3 11 19.4	12.5	167 7 8.9	+0 17 17.8	12.5	218 50 47.8	4 15 57.3
13.0	135 5 28.0	2 39 11.4	13.0	174 8 28.6	0 54 25.0	13.0	225 30 16.7	4 32 43.6
13.5	142 15 5.3	—2 4 26.9	13.5	181 8 46.9	+1 30 35.2	13.5	232 6 55.8	+4 45 41.7
14.0	149 26 1.2	1 27 38.8	14.0	188 7 51.3	2 5 14.9	14.0	238 40 39.0	4 54 46.1
14.5	156 37 53.7	0 49 23.3	14.5	195 5 26.2	2 37 52.5	14.5	245 11 19.6	4 59 54.8
15.0	163 50 16.6	—0 10 19.3	15.0	202 1 14.4	3 7 59.0	15.0	251 38 51.0	5 1 9.2
15.5	171 2 40.0	+0 28 52.7	15.5	208 54 56.0	8 35 8.2	15.5	258 3 7.4	4 58 34.3
16.0	178 14 30.7	+1 7 31.8	16.0	215 46 10.0	+3 58 58.8	16.0	264 24 4.6	+4 52 17.4
16.5	185 25 12.5	1 44 57.8	16.5	222 34 34.5	4 19 12.8	16.5	270 41 40.3	4 42 28.5
17.0	192 34 7.5	2 20 32.7	17.0	229 19 48.0	4 35 36.9	17.0	276 55 54.8	4 29 20.1
17.5	199 40 37.3	2 53 41.5	17.5	236 1 30.3	4 48 2.8	17.5	283 6 51.6	4 13 6.5
18.0	206 44 4.1	3 23 53.5	18.0	242 39 23.3	4 56 26.4	18.0	289 14 37.6	3 54 3.3
18.5	213 43 52.2	+3 50 43.0	18.5	249 13 12.3	+5 0 47.8	18.5	295 19 23.3	+3 32 26.9
19.0	220 39 29.4	4 13 49.9	19.0	255 42 46.6	5 1 11.0	19.0	301 21 23.0	3 8 34.5
19.5	227 30 28.2	4 32 59.7	19.5	262 8 0.1	4 57 43.8	19.5	307 20 54.7	2 42 43.8
20.0	234 16 26.9	4 48 3.3	20.0	268 28 52.0	4 50 36.3	20.0	313 18 20.4	2 15 12.6
20.5	240 57 10.0	4 58 57.2	20.5	274 45 26.6	4 40 0.9	20.5	319 14 5.3	1 46 18.4
21.0	247 32 28.9	+5 5 42.3	21.0	280 57 53.6	+4 26 11.7	21.0	325 8 38.0	+1 16 18.9
21.5	254 2 22.1	5 8 23.5	21.5	287 6 27.7	4 9 23.9	21.5	331 2 30.1	0 45 31.6
22.0	260 26 54.8	5 7 8.6	22.0	293 11 29.0	3 49 53.5	22.0	336 56 16.0	+0 14 13.7
22.5	266 46 18.8	5 2 8.1	22.5	299 13 21.6	3 27 57.0	22.5	342 50 32.0	—0 17 17.6
23.0	273 0 51.9	4 53 34.4	23.0	305 12 34.0	3 3 50.7	23.0	348 45 56.6	0 48 44.8
23.5	279 10 57.0	+4 41 40.7	23.5	311 9 38.1	+2 37 51.0	23.5	354 43 9.5	—1 19 50.5
24.0	285 17 1.6	4 26 41.3	24.0	317 5 8.5	2 10 14.3	24.0	0 42 51.2	1 50 16.6
24.5	291 19 37.0	4 8 50.7	24.5	322 59 42.6	1 41 16.7	24.5	6 45 42.1	2 19 44.4
25.0	297 19 17.5	3 48 23.6	25.0	328 53 59.7	1 11 14.4	25.0	12 52 22.1	2 47 54.7
25.5	303 16 39.8	3 25 34.9	25.5	334 48 40.1	0 40 23.8	25.5	19 3 29.8	3 14 27.3
26.0	309 12 22.2	+3 0 39.2	26.0	340 44 25.0	+0 9 1.2	26.0	25 19 41.0	—3 39 1.0
26.5	315 7 4.0	2 33 51.4	26.5	346 41 55.6	—0 22 36.3	26.5	31 41 28.1	4 1 13.8
27.0	321 1 25.0	2 5 26.5	27.0	352 41 52.6	0 54 10.9	27.0	38 9 18.7	4 20 43.0
27.5	326 56 4.7	1 35 39.9	27.5	358 44 55.4	1 25 24.0	27.5	44 43 34.6	4 37 5.8
28.0	332 51 42.1	1 4 47.3	28.0	4 51 41.1	1 55 56.0	28.0	51 24 29.9	4 49 59.3
28.5	338 48 54.4	0 3[illegible] 5.5	28.5	11 2 44.2	2 25 26.0	28.5	58 12 10.5	4 59 1.7
29.0	344 48 17.4	+0 0 51.7	29.0	17 18 35.4	—2 53 32.0	29.0	65 6 32.3	—5 3 53.2
29.5	350 50 24.5	—0 31 35.5	29.5	23 39 40.3	3 19 51.0	29.5	72 7 21.2	5 4 17.0
30.0	356 55 45.9	1 3 56.1	30.0	30 6 19.0	3 43 58.8	30.0	79 14 12.4	5 0 0.5
30.5	3 4 48.0	1 35 49.2	30.5	36 38 44.7	4 5 30.7	30.5	86 26 30.5	4 50 56.4
31.0	9 17 53.4	—2 6 52.4	31.0	43 17 3.4	—4 24 2.3	31.0	93 43 30.9	—4 37 3.8
31.5	15 35 20.0	—2 36 42.2	31.5	50 1 12.5	—4 39 9.7	31.5	101 4 20.9	—4 18 29.3

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JULY.		Day of Month.	AUGUST.		Day of Month.	SEPTEMBER.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	93° 43′ 30″.9	−4° 37′ 3″.8	1.0	147° 8′ 51″.6	−0° 56′ 4″.6	1.0	200° 18′ 49″.8	+3° 37′ 30″.3
1.5	101 4 20.9	4 18 29.3	1.5	154 40 44.7	−0 14 57.1	1.5	207 30 28.7	4 4 50.2
2.0	108 28 1.6	3 55 27.0	2.0	162 9 56.8	+0 26 13.2	2.0	214 35 44.6	4 27 58.7
2.5	115 53 30.7	3 28 18.8	2.5	169 35 33.4	1 6 38.4	2.5	221 34 22.6	4 46 45.4
3.0	123 19 45.2	2 57 33.3	3.0	176 56 48.7	1 45 34.2	3.0	228 26 17.9	5 1 5.5
3.5	130 45 43.5	−2 23 45.2	3.5	184 13 6.4	+2 22 21.3	3.5	235 11 33.7	+5 10 59.7
4.0	138 10 28.3	1 47 33.9	4.0	191 24 0.0	2 56 25.7	4.0	241 50 20.8	5 16 32.7
4.5	145 33 8.5	1 9 41.5	4.5	198 29 12.1	3 27 19.7	4.5	248 22 56.1	5 17 52.4
5.0	152 53 0.3	−0 30 51.6	5.0	205 28 33.9	3 54 41.6	5.0	254 49 41.5	5 15 9.2
5.5	160 9 28.1	+0 8 12.9	5.5	212 22 4.2	4 18 15.3	5.5	261 11 2.5	5 8 35.5
6.0	167 22 4.9	+0 46 50.7	6.0	219 9 48.0	+4 37 50.1	6.0	267 27 27.2	+4 58 24.7
6.5	174 30 31.6	1 24 23.1	6.5	225 51 55.4	4 53 19.6	6.5	273 39 25.0	4 44 51.1
7.0	181 34 36.4	2 0 15.3	7.0	232 28 40.7	5 4 41.5	7.0	279 47 26.9	4 28 9.7
7.5	188 34 14.2	2 33 56.5	7.5	239 0 21.1	5 11 56.9	7.5	285 52 3.6	4 8 36.0
8.0	195 29 24.8	3 5 0.0	8.0	245 27 15.7	5 15 9.6	8.0	291 53 45.3	3 46 25.7
8.5	202 20 12.1	+3 33 3.3	8.5	251 49 45.0	+5 14 25.7	8.5	297 53 1.7	+3 21 55.1
9.0	209 6 43.0	3 57 48.5	9.0	258 8 10.0	5 9 53.2	9.0	303 50 21.1	2 55 20.7
9.5	215 49 6.4	4 19 1.1	9.5	264 22 51.5	5 1 41.9	9.5	309 46 10.6	2 26 59.5
10.0	222 27 32.2	4 36 30.6	10.0	270 34 10.3	4 50 3.1	10.0	315 40 55.5	1 57 8.8
10.5	229 2 10.6	4 50 9.7	10.5	276 42 26.4	4 35 9.1	10.5	321 34 59.6	1 26 6.6
11.0	235 33 11.8	+4 59 54.5	11.0	282 47 58.9	+4 17 13.7	11.0	327 28 45.2	+0 54 11.2
11.5	242 0 45.3	5 5 43.8	11.5	288 51 6.4	3 56 31.3	11.5	333 22 32.9	+0 21 41.4
12.0	248 25 0.1	5 7 39.4	12.0	294 52 6.3	3 33 17.6	12.0	339 16 41.8	−0 11 3.7
12.5	254 46 4.2	5 5 45.6	12.5	300 51 15.4	3 7 49.0	12.5	345 11 29.9	0 43 44.3
13.0	261 4 5.2	5 0 9.0	13.0	306 48 50.1	2 40 22.8	13.0	351 7 14.0	1 16 0.7
13.5	267 19 10.0	+4 50 58.4	13.5	312 45 6.4	+2 11 16.9	13.5	357 4 9.9	−1 47 32.7
14.0	273 31 25.4	4 38 24.7	14.0	318 40 20.0	1 40 49.7	14.0	3 2 32.9	2 18 0.4
14.5	279 40 58.3	4 22 40.5	14.5	324 34 46.9	1 9 20.2	14.5	9 2 37.7	2 47 4.3
15.0	285 47 56.1	4 4 0.1	15.0	330 28 43.5	0 37 7.6	15.0	15 4 39.0	3 14 24.5
15.5	291 52 27.3	3 42 39.0	15.5	336 22 27.0	+0 4 31.1	15.5	21 8 51.5	3 39 42.1
16.0	297 54 41.1	+3 18 53.7	16.0	342 16 15.1	−0 28 9.8	16.0	27 15 30.0	−4 2 38.6
16.5	303 54 48.9	2 53 1.8	16.5	348 10 26.8	1 0 35.5	16.5	33 24 49.6	4 22 56.3
17.0	309 53 3.6	2 25 21.3	17.0	354 5 22.3	1 32 26.7	17.0	39 37 6.5	4 40 18.4
17.5	315 49 40.2	1 56 10.8	17.5	0 1 23.0	2 3 24.3	17.5	45 52 37.0	4 54 29.2
18.0	321 44 56.1	1 25 48.8	18.0	5 58 52.0	2 33 9.5	18.0	52 11 38.2	5 5 14.1
18.5	327 39 11.3	+0 54 34.1	18.5	11 58 13.6	−3 1 23.3	18.5	58 34 27.4	−5 12 20.0
19.0	333 32 47.9	+0 22 45.5	19.0	17 59 53.7	3 27 47.4	19.0	65 1 22.2	5 15 35.2
19.5	339 26 10.7	−0 9 18.8	19.5	24 4 19.5	3 52 3.5	19.5	71 32 40.2	5 14 49.7
20.0	345 19 47.0	0 41 20.2	20.0	30 11 59.3	4 13 53.8	20.0	78 8 37.9	5 9 55.8
20.5	351 14 6.1	1 13 0.3	20.5	36 23 21.8	4 33 0.4	20.5	84 49 30.5	5 0 48.3
21.0	357 9 39.8	−1 44 1.1	21.0	42 38 56.2	−4 49 5.9	21.0	91 35 31.1	−4 47 24.7
21.5	3 7 1.7	2 14 4.6	21.5	48 59 11.2	5 1 53.2	21.5	98 26 50.0	4 29 46.2
22.0	9 6 46.7	2 42 52.4	22.0	55 24 34.5	5 11 5.9	22.0	105 23 33.0	4 7 58.1
22.5	15 9 31.1	3 10 5.9	22.5	61 55 31.7	5 16 28.3	22.5	112 25 41.2	3 42 10.3
23.0	21 15 51.6	3 35 26.4	23.0	68 32 25.9	5 17 45.9	23.0	119 33 9.4	3 12 37.9
23.5	27 26 24.8	−3 58 34.6	23.5	75 15 35.4	−5 14 46.3	23.5	126 45 45.1	−2 39 41.9
24.0	33 41 46.5	4 19 10.9	24.0	82 5 13.9	5 7 19.5	24.0	134 3 7.9	2 3 49.5
24.5	40 2 30.5	4 36 55.2	24.5	89 1 28.1	4 55 18.6	24.5	141 24 48.8	1 25 33.7
25.0	46 29 7.8	4 51 27.4	25.0	96 4 17.3	4 38 41.2	25.0	148 50 10.0	0 45 33.3
25.5	53 2 5.4	5 2 27.5	25.5	103 13 31.5	4 17 30.3	25.5	156 18 24.9	−0 4 32.0
26.0	59 41 44.6	−5 9 36.1	26.0	110 28 51.1	−3 51 55.1	26.0	163 48 39.5	+0 36 43.4
26.5	66 28 20.2	5 12 35.1	26.5	117 49 46.3	3 22 11.8	26.5	171 19 53.5	1 17 23.9
27.0	73 21 58.6	5 11 8.7	27.0	125 15 37.0	2 48 44.2	27.0	178 51 1.9	1 56 40.9
27.5	80 22 36.6	5 5 4.0	27.5	132 45 33.2	2 12 4.0	27.5	186 20 57.8	2 33 48.2
28.0	87 30 0.7	4 54 12.8	28.0	140 18 36.0	1 32 49.8	28.0	193 48 34.8	3 8 3.8
28.5	94 43 46.0	4 38 32.6	28.5	147 53 40.3	0 51 46.3	28.5	201 12 49.2	3 38 51.6
29.0	102 3 16.9	−4 18 7.4	29.0	155 29 35.7	−0 9 42.7	29.0	208 32 43.2	+4 5 42.4
29.5	109 27 47.2	3 53 9.1	29.5	163 5 10.3	+0 32 29.4	29.5	215 47 26.6	4 28 15.0
30.0	116 56 20.4	3 23 57.4	30.0	170 39 12.3	1 13 58.4	30.0	222 56 18.0	4 46 15.7
30.5	124 27 53.1	2 51 0.6	30.5	178 10 33.7	1 53 55.1	30.5	229 58 46.5	4 59 38.2
31.0	132 1 16.5	2 14 54.2	31.0	185 38 11.9	2 31 34.3	31.0	236 54 32.0	5 8 22.5
31.5	139 35 19.7	−1 36 20.0	31.5	193 1 12.4	+3 6 16.8	31.5	243 43 24.6	+5 12 34.5

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	OCTOBER.		Day of Month.	NOVEMBER.		Day of Month.	DECEMBER.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
	° ′ ″	° ′ ″		° ′ ″	° ′ ″		° ′ ″	° ′ ″
1.0	236 54 32.0	+5 8 22.5	1.0	284 15 18.8	+3 56 10.3	1.0	316 30 12.3	+1 19 58.4
1.5	243 43 24.6	5 12 34.5	1.5	290 28 26.7	3 33 50.4	1.5	322 28 26.1	0 49 2.3
2.0	250 25 24.2	5 12 24.0	2.0	296 36 50.9	3 9 17.2	2.0	328 24 30.2	+0 17 44.0
2.5	257 0 39.9	5 8 4.3	2.5	302 41 7.2	2 42 50.5	2.5	334 19 5.3	—0 13 39.0
3.0	263 29 28.3	4 59 51.0	3.0	308 41 54.2	2 14 49.4	3.0	340 12 53.2	0 44 49.4
3.5	269 52 12.4	+4 48 0.9	3.5	314 39 52.4	+1 45 32.2	3.5	346 6 36.4	—1 15 30.6
4.0	276 9 20.4	4 32 51.8	4.0	320 35 43.2	1 15 16.6	4.0	352 0 57.2	1 45 26.1
4.5	282 21 24.7	4 14 41.8	4.5	326 30 8.1	0 44 20.0	4.5	357 56 37.3	2 14 19.0
5.0	288 29 0.2	3 53 48.9	5.0	332 23 48.7	+0 12 59.7	5.0	3 54 16.8	2 41 52.7
5.5	294 32 43.6	3 30 31.1	5.5	338 17 25.2	—0 18 27.3	5.5	9 54 34.0	3 7 49.8
6.0	300 33 12.6	+3 5 5.9	6.0	344 11 36.0	—0 49 43.9	6.0	15 58 4.5	—3 31 52.6
6.5	306 31 4.9	2 37 50.6	6.5	350 6 57.9	1 20 32.4	6.5	22 5 20.1	3 53 43.2
7.0	312 26 58.0	2 9 2.5	7.0	356 4 4.9	1 50 35.1	7.0	28 16 49.0	4 13 3.2
7.5	318 21 28.1	1 38 58.9	7.5	2 3 27.6	2 19 33.3	7.5	34 32 53.9	4 29 34.0
8.0	324 15 10.0	1 7 57.0	8.0	8 5 33.5	2 47 8.4	8.0	40 53 52.1	4 42 57.6
8.5	330 8 36.6	+0 36 14.2	8.5	14 10 45.9	—3 13 0.9	8.5	47 19 54.9	—4 52 56.7
9.0	336 2 18.6	+0 4 8.5	9.0	20 19 24.0	3 36 51.2	9.0	53 51 6.8	4 59 15.4
9.5	341 56 44.2	—0 28 1.7	9.5	26 31 42.3	3 58 19.7	9.5	60 27 25.3	5 1 39.6
10.0	347 52 19.2	0 59 57.8	10.0	32 47 50.5	4 17 7.2	10.0	67 8 41.3	4 59 58.2
10.5	353 49 26.1	1 31 20.4	10.5	39 7 53.7	4 32 55.1	10.5	73 54 38.7	4 54 3.6
11.0	359 48 25.0	—2 1 50.0	11.0	45 31 52.5	—4 45 26.1	11.0	80 44 55.6	—4 43 52.7
11.5	5 49 33.5	2 31 6.6	11.5	51 59 43.0	4 54 24.6	11.5	87 39 5.2	4 29 27.0
12.0	11 53 5.6	2 58 50.0	12.0	58 31 17.1	4 59 37.5	12.0	94 36 36.6	4 10 53.4
12.5	17 59 13.0	3 24 40.2	12.5	65 6 23.8	5 0 54.2	12.5	101 36 56.3	3 48 24.3
13.0	24 8 5.2	3 48 17.5	13.0	71 44 49.3	4 58 7.8	13.0	108 39 29.9	3 22 17.5
13.5	30 19 48.9	—4 9 22.9	13.5	78 26 18.6	—4 51 14.7	13.5	115 43 43.4	—2 52 55.6
14.0	36 34 29.5	4 27 38.2	14.0	85 10 35.6	4 40 15.5	14.0	122 49 4.7	2 20 45.9
14.5	42 52 10.3	4 42 46.6	14.5	91 57 24.2	4 25 14.9	14.5	129 55 4.4	1 46 19.5
15.0	49 12 53.7	4 54 32.9	15.0	98 46 29.9	4 6 21.9	15.0	137 1 16.7	1 10 10.4
15.5	55 36 41.4	5 2 43.9	15.5	105 37 39.0	3 43 49.3	15.5	144 7 20.0	—0 32 54.1
16.0	62 3 35.2	—5 7 8.5	16.0	112 30 41.1	—3 17 54.1	16.0	151 12 56.9	+0 4 52.4
16.5	68 33 36.5	5 7 38.2	16.5	119 25 27.2	2 48 56.8	16.5	158 17 53.7	0 42 32.4
17.0	75 6 47.4	5 4 7.0	17.0	126 21 50.7	2 17 21.6	17.0	165 22 0.3	1 19 29.7
17.5	81 43 10.9	4 56 31.9	17.5	133 19 47.2	1 43 35.2	17.5	172 25 8.8	1 55 9.3
18.0	88 22 50.3	4 44 53.2	18.0	140 19 13.6	1 8 7.2	18.0	179 27 13.6	2 28 58.4
18.5	95 5 50.0	—4 29 14.2	18.5	147 20 7.7	—0 31 29.4	18.5	186 28 9.6	+3 0 26.3
19.0	101 52 14.7	4 9 41.6	19.0	154 22 26.8	+0 5 44.5	19.0	193 27 51.5	3 29 5.3
19.5	108 42 9.4	3 46 26.0	19.5	161 26 6.8	0 42 59.7	19.5	200 26 13.2	3 54 30.9
20.0	115 35 38.2	3 19 41.5	20.0	168 31 1.7	1 19 40.5	20.0	207 23 7.2	4 16 22.1
20.5	122 32 44.2	2 49 46.4	20.5	175 37 1.8	1 55 11.3	20.5	214 18 24.0	4 34 21.5
21.0	129 33 28.5	—2 17 2.7	21.0	182 43 53.5	+2 28 56.8	21.0	221 11 52.0	+4 48 16.0
21.5	136 37 48.8	1 41 56.9	21.5	189 51 18.8	3 0 23.3	21.5	228 3 17.4	4 57 56.7
22.0	143 45 38.7	1 4 59.6	22.0	196 58 54.0	3 28 59.3	22.0	234 52 24.6	5 3 18.9
22.5	150 56 46.5	—0 26 44.7	22.5	204 6 11.4	3 54 16.4	22.5	241 38 56.6	5 4 22.4
23.0	158 10 54.4	+0 12 10.3	23.0	211 12 38.4	4 15 50.4	23.0	248 22 35.9	5 1 11.1
23.5	165 27 38.1	+0 51 5.1	23.5	218 17 39.3	+4 33 21.6	23.5	255 3 5.2	+4 53 53.3
24.0	172 46 25.8	1 29 18.0	24.0	225 20 36.2	4 46 35.6	24.0	261 40 8.3	4 42 40.7
24.5	180 6 38.9	2 6 6.7	24.5	232 20 50.7	4 55 24.1	24.5	268 13 30.8	4 27 48.3
25.0	187 27 32.1	2 40 50.0	25.0	239 17 45.5	4 59 44.0	25.0	274 43 1.4	4 9 34.2
25.5	194 48 14.9	3 12 49.4	25.5	246 10 46.1	4 59 38.3	25.5	281 8 32.2	3 48 18.4
26.0	202 7 53.5	+3 41 30.3	26.0	252 59 22.2	+4 55 14.6	26.0	287 29 59.3	+3 24 22.4
26.5	209 25 32.2	4 6 23.4	26.5	259 43 9.1	4 46 45.4	26.5	293 47 23.3	2 58 8.8
27.0	216 40 15.7	4 27 5.6	27.0	266 21 49.0	4 34 26.8	27.0	300 0 49.6	2 30 0.5
27.5	223 51 11.9	4 43 21.1	27.5	272 55 10.8	4 18 37.6	27.5	306 10 28.1	2 0 20.6
28.0	230 57 33.7	4 55 0.9	28.0	279 23 11.5	3 59 38.7	28.0	312 16 33.4	1 29 31.4
28.5	237 58 41.4	5 2 2.7	28.5	285 45 54.9	3 37 52.2	28.5	318 19 24.8	0 57 54.9
29.0	244 54 3.1	+5 4 30.7	29.0	292 3 32.2	+3 13 40.3	29.0	324 19 25.4	+0 25 51.8
29.5	251 43 16.6	5 2 34.2	29.5	298 16 20.8	2 47 25.5	29.5	330 17 2.2	—0 6 18.0
30.0	258 26 9.3	4 56 26.8	30.0	304 24 44.1	2 19 29.7	30.0	336 12 45.4	0 38 15.6
30.5	265 2 38.1	4 46 25.3	30.5	310 29 10.4	1 50 14.0	30.5	342 7 8.4	1 9 43.0
31.0	271 32 48.7	4 32 48.4	31.0	316 30 12.3	1 19 58.4	31.0	348 0 47.0	1 40 23.1
31.5	277 56 55.1	+4 15 56.5	31.5	322 28 26.1	+0 49 2.3	31.5	353 54 17.9	—2 9 59.2

FOR GREENWICH MEAN NOON.

Date.	THE MOON'S EQUATOR. *i* Inclination to Earth's Equator.	THE MOON'S EQUATOR. Δ Ascend'g Node on Earth's Equator to Ascending Node on Ecliptic.	THE MOON'S EQUATOR. ☊′ Ascend'g Node on Earth's Equator.	☾ Mean Longitude of the Moon.
	° ′	° ′	° ′	° ′
Jan. 0	24 54.6	350 29.7	359 23.1	219 31.6
10	24 54.4	349 59.7	359 21.2	351 17.5
20	24 54.3	349 29.7	359 19.3	123 3.3
30	24 54.1	348 59.6	359 17.4	254 49.1
Feb. 9	24 53.9	348 29.6	359 15.5	26 35.0
19	24 53.8	347 59.6	359 13.6	158 20.8
March 1	24 53.6	347 29.5	359 11.3	290 6.6
11	24 53.5	346 59.5	359 9.8	61 52.5
21	24 53.3	346 29.5	359 7.9	193 38.3
31	24 53.1	345 59.4	359 6.0	325 24.1
April 10	24 52.9	345 29.4	359 4.1	97 10.0
20	24 52.7	344 59.3	359 2.2	228 55.8
30	24 52.5	344 29.3	359 0.4	0 41.7
May 10	24 52.2	343 59.2	358 58.5	132 27.5
20	24 52.0	343 29.1	358 56.7	264 13.3
30	24 51.7	342 59.1	358 54.8	35 59.2
June 9	24 51.5	342 29.0	358 52.9	167 45.0
19	24 51.2	341 58.9	358 51.1	299 30.8
29	24 51.0	341 28.8	358 49.2	71 16.7
July 9	24 50.7	340 58.7	358 47.4	203 2.5
19	24 50.5	340 28.7	358 45.5	334 48.4
29	24 50.3	339 58.6	358 43.7	106 34.2
Aug. 8	24 50.0	339 28.4	358 41.9	238 20.0
18	24 49.7	338 58.3	358 40.0	10 5.9
28	24 49.4	338 28.1	358 38.2	141 51.7
Sept. 7	24 49.1	337 58.0	358 36.4	273 37.5
17	24 48.8	337 27.9	358 34.5	45 23.4
27	24 48.5	336 57.8	358 32.7	177 9.2
Oct. 7	24 48.2	336 27.7	358 30.9	308 55.0
17	24 47.8	335 57.6	358 29.1	80 40.9
27	24 47.4	335 27.5	358 27.3	212 26.7
Nov. 6	24 47.1	334 57.3	358 25.5	344 12.6
16	24 46.7	334 27.2	358 22.8	115 58.4
26	24 46.3	333 57.0	358 21.0	247 44.2
Dec. 6	24 45.9	333 26.9	358 19.3	19 30.1
16	24 45.6	332 56.7	358 17.5	151 15.9
26	24 45.2	332 26.6	358 15.8	283 1.7
36	24 44.8	331 56.4	358 14.0	54 47.6

Mean Solar Days.	Motion of ☾.
	° ′
0.1	1 19.06
0.2	2 38.12
0.3	3 57.18
0.4	5 16.23
0.5	6 35.29
0.6	7 54.35
0.7	9 13.41
0.8	10 32.47
0.9	11 51.53
1.0	13 10.58
2.0	26 21.17
3.0	39 31.75
4.0	52 42.33
5.0	65 52.92
6.0	79 3.50
7.0	92 14.09
8.0	105 24.67
9.0	118 35.25
10.0	131 45.84
Hours.	° ′
1	0 32.94
2	1 5.88
3	1 38.82
4	2 11.76
5	2 44.70
6	3 17.65
7	3 50.59
8	4 23.53
9	4 56.47
10	5 29.41
11	6 2.35
12	6 35.29
13	7 8.23
14	7 41.17
15	8 14.11
16	8 47.06
17	9 20.00
18	9 52.94
19	10 25.88
20	10 58.82
21	11 31.76
22	12 4.70
23	12 37.64

TABLE FOR THE LIBRATION OF THE MOON.

Argument, (☊—λ) or (☊—λ—180°).

☊ − λ	Δ λ	$\frac{1}{a}$	B		☊ − λ	Δ λ	$\frac{1}{a}$	B	
0°	0′.0	39	0° 0′.0	180°	46°	0′.6	56	1° 3′.9	134°
1	0.0	39	0 1.6	179	47	0.6	57	1 4.9	133
2	0.0	39	0 3.1	178	48	0.6	58	1 6.0	132
3	0.1	39	0 4.7	177	49	0.6	59	1 7.0	131
4	0.1	39	0 6.2	176	50	0.6	60	1 8.0	130
5	0.1	39	0 7.7	175	51	0.6	62	1 9.0	129
6	0.2	39	0 9.3	174	52	0.6	63	1 10.0	128
7	0.2	39	0 10.8	173	53	0.5	64	1 10.9	127
8	0.2	39	0 12.4	172	54	0.5	66	1 11.8	126
9	0.2	39	0 13.9	171	55	0.5	67	1 12.7	125
10	0.2	39	0 15.4	170	56	0.5	69	1 13.6	124
11	0.3	39	0 16.9	169	57	0.5	71	1 14.5	123
12	0.3	40	0 18.5	168	58	0.5	73	1 15.3	122
13	0.3	40	0 20.0	167	59	0.5	75	1 16.1	121
14	0.3	40	0 21.5	166	60	0.5	77	1 16.9	120
15	0.3	40	0 23.0	165	61	0.5	80	1 17.6	119
16	0.3	40	0 24.5	164	62	0.5	83	1 18.4	118
17	0.3	40	0 26.0	163	63	0.5	86	1 19.1	117
18	0.3	41	0 27.4	162	64	0.5	89	1 19.8	116
19	0.4	41	0 28.9	161	65	0.4	92	1 20.4	115
20	0.4	41	0 30.4	160	66	0.4	95	1 21.1	114
21	0.4	41	0 31.8	159	67	0.4	99	1 21.7	113
22	0.4	42	0 33.2	158	68	0.4	103	1 22.3	112
23	0.4	42	0 34.7	157	69	0.4	108	1 22.9	111
24	0.4	42	0 36.1	156	70	0.4	113	1 23.4	110
25	0.4	43	0 37.5	155	71	0.4	119	1 23.9	109
26	0.5	43	0 38.9	154	72	0.4	125	1 24.4	108
27	0.5	43	0 40.3	153	73	0.4	132	1 24.9	107
28	0.5	44	0 41.7	152	74	0.3	141	1 25.3	106
29	0.5	44	0 43.1	151	75	0.3	150	1 25.7	105
30	0.5	45	0 44.4	150	76	0.3	160	1 26.1	104
31	0.5	45	0 45.7	149	77	0.3	172	1 26.5	103
32	0.5	46	0 47.0	148	78	0.2	186	1 26.8	102
33	0.5	46	0 48.4	147	79	0.2	202	1 27.1	101
34	0.5	47	0 49.7	146	80	0.2	222	1 27.4	100
35	0.5	47	0 51.0	145	81	0.2	247	1 27.7	99
36	0.5	48	0 52.2	144	82	0.2	278	1 27.9	98
37	0.5	48	0 53.4	143	83	0.1	318	1 28.1	97
38	0.6	49	0 54.7	142	84	0.1	370	1 28.3	96
39	0.6	50	0 55.9	141	85	0.1	440	1 28.5	95
40	0.6	50	0 57.1	140	86	0.1	555	1 28.6	94
41	0.6	51	0 58.3	139	87	0.1	740	1 28.7	93
42	0.6	52	0 59.4	138	88	0.0	1110	1 28.7	92
43	0.6	53	1 0.6	137	89	0.0	2220	1 28.8	91
44	0.6	54	1 1.7	136	90	0.0	∞	1 28.8	90
45	0.6	55	1 2.8	135					
	Δ λ	$\frac{1}{a}$	B	☊ − λ		Δ λ	$\frac{1}{a}$	B	☊ − λ

Δ λ has the sign of tan (λ — ☊)
a has the sign of cos (☊ — λ)
B has the sign of sin (☊ — λ)

FOR GREENWICH MEAN NOON.

Date.	Apparent Obliquity of the Ecliptic. (Hansen.)	Equation of Equinoxes In Longitude.	Equation of Equinoxes In R. A.	Precession of Equinoxes in Longitude.	The Sun's Aberration.	The Sun's Hor. Par.	Mean Longitude of Moon's Ascending Node.
	° ′ ″	″	s	″	″	″	° ′
Jan. 0	23 27 4.86	− 2.67	− 0.163	0.00	− 20.80	9.00	169 56.1
10	4.97	2.44	0.150	1.38	20.79	9.00	169 24.3
20	5.11	2.34	0.143	2.75	20.77	8.99	168 52.5
30	5.30	2.37	0.145	4.13	20.74	8.98	168 20.8
Feb. 9	5.50	2.54	0.155	5.50	20.71	8.96	167 49.0
19	23 27 5.69	− 2.86	− 0.175	6.88	− 20.67	8.94	167 17.2
March 1	5.84	3.31	0.202	8.26	20.63	8.92	166 45.4
11	5.93	3.85	0.236	9.63	20.57	8.90	166 13.7
21	5.95	4.43	0.271	11.01	20.51	8.87	165 41.9
31	5.91	5.01	0.306	12.38	20.45	8.85	165 10.1
April 10	23 27 5.82	− 5.52	− 0.337	13.76	− 20.39	8.82	164 38.4
20	5.69	5.94	0.363	15.14	20.34	8.80	164 6.6
30	5.53	6.24	0.382	16.51	20.29	8.78	163 34.8
May 10	5.36	6.40	0.391	17.89	20.24	8.76	163 3.0
20	5.21	6.41	0.392	19.26	20.19	8.74	162 31.3
30	23 27 5.09	− 6.30	− 0.385	20.64	− 20.16	8.72	161 59.5
June 9	5.00	6.11	0.374	22.02	20.13	8.71	161 27.7
19	4.96	5.87	0.359	23.39	20.11	8.71	160 56.0
29	5.01	5.63	0.344	24.77	20.11	8.70	160 24.2
July 9	5.11	5.41	0.331	26.14	20.10	8.70	159 52.4
19	23 27 5.24	− 5.26	− 0.322	27.52	− 20.12	8.71	159 20.6
29	5.41	5.23	0.320	28.90	20.14	8.72	158 48.9
Aug. 8	5.61	5.33	0.326	30.27	20.17	8.73	158 17.1
18	5.82	5.56	0.340	31.65	20.20	8.75	157 45.3
28	6.01	5.92	0.362	33.02	20.24	8.77	157 13.5
Sept. 7	23 27 6.15	− 6.39	− 0.391	34.40	− 20.29	8.79	156 41.8
17	6.22	6.93	0.424	35.78	20.35	8.81	156 10.0
27	6.23	7.51	0.459	37.15	20.41	8.84	155 38.2
Oct. 7	6.20	8.06	0.493	38.53	20.47	8.87	155 6.5
17	6.12	8.55	0.523	39.90	20.53	8.88	154 34.7
27	23 27 5.99	− 8.93	− 0.546	41.28	− 20.59	8.91	154 2.9
Nov. 6	5.83	9.16	0.560	42.66	20.64	8.93	153 31.1
16	5.68	9.24	0.565	44.03	20.69	8.95	152 59.4
26	5.54	9.18	0.561	45.41	20.73	8.97	152 27.6
Dec. 6	5.44	8.98	0.549	46.78	20.76	8.98	151 55.8
16	23 27 5.41	− 8.71	− 0.533	48.16	− 20.78	8.99	151 24.0
26	5.44	8.41	0.514	49.54	20.79	9.00	150 52.3
36	23 27 5.53	− 8.14	− 0.498	50.91	− 20.79	9.00	150 20.5

Mean Obliquity, 1886.0,	23° 27′ 14″.58 (Hansen).		
Mean Obliquity, 1886.0,	23° 27′ 14″.26 (Peters).		
Precession for 1886.5	50″.2607	log 1.70123	
Precession in a Solar Day	0″.1376	log 9.13863	
Precession in a Sidereal Day	0″.1372	log 9.13744	
Sun's Mean Equatorial Horizontal Parallax .	8″.848	log 0.94685	

Daily Motion of ☊

—3′.177

PART II

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF WASHINGTON

FORMULÆ FOR THE REDUCTION OF THE POSITIONS OF THE FIXED STARS, USING THE NOTATION OF BESSEL, AND THE CONSTANTS OF PETERS AND STRUVE.

NOTATION.

τ, the time, reckoned in units of one year, from the beginning of the Besselian fictitious year, (1885, December $30^d.711$ = 1886, January $0^d.0 - 0^d.289$, Washington mean time),

α_0, δ_0, the star's mean right ascension and declination at the beginning of the fictitious year,

α, δ, the star's apparent right ascension and declination at the time τ,

μ, μ', the annual proper motion in right ascension and declination,

$\odot$, the sun's true longitude,

Ω, the longitude of the moon's ascending node,

ω, the obliquity of the ecliptic,

Γ, the longitude of the sun's perigee,

Γ', the longitude of the moon's perigee,

☾, the moon's mean longitude.

BESSELIAN STAR-NUMBERS.

$$\begin{aligned}
A = \tau &- 0.34248 \sin \Omega & &- 0.00011 \sin (3\odot - \Gamma)\\
&+ 0.00410 \sin 2\Omega & &- 0.00005 \sin 2(\odot - \Omega)\\
&- 0.02521 \sin 2\odot & &+ 0.00010 \sin 2(\odot - \Gamma')\\
&+ 0.00293 \sin (\odot + 82^\circ\ 8') & &+ 0.00009 \sin (2\Gamma' - \Omega)\\
&+ 0.00025 \sin (2\odot - \Omega) & &+ 0.00005 \cos \Gamma'\\
&- 0.00405 \sin 2☾ & &+ 0.00004 \sin 2\Gamma'\\
&+ 0.00135 \sin (☾ - \Gamma')
\end{aligned}$$

$$\begin{aligned}
B = &- 9''.2239 \cos \Omega & &- 0''.0027 \cos (3\odot - \Gamma)\\
&+ 0.0895 \cos 2\Omega & &+ 0.0067 \cos (2\odot - \Omega)\\
&- 0.5506 \cos 2\odot & &+ 0.0024 \cos (2\Gamma' - \Omega)\\
&- 0.0092 \cos (\odot + 280^\circ\ 57') & &- 0.0023 \sin \Gamma'\\
&- 0.0886 \cos 2☾ & &+ 0.0008 \cos 2\Gamma'
\end{aligned}$$

$$\begin{aligned}
C &= - 20''.4451 \cos \omega \cos \odot\\
D &= - 20.4451 \sin \odot\\
E &= - \ 0.0461 \sin \Omega + 0''.0014 \sin 2\Omega - 0''.0033 \sin 2\odot
\end{aligned}$$

Bessel's *Star-Constants.*

$$\begin{aligned}
a &= 3^s.07244 + 1^s.33689 \sin \alpha_0 \tan \delta_0 = \text{precession in right ascension}\\
b &= \tfrac{1}{15} \cos \alpha_0 \tan \delta_0\\
c &= \tfrac{1}{15} \cos \alpha_0 \sec \delta_0\\
d &= \tfrac{1}{15} \sin \alpha_0 \sec \delta_0\\
a' &= 20''.0533 \cos \alpha_0 = \text{precession in declination}\\
b' &= - \sin \alpha_0\\
c' &= \tan \omega \cos \delta_0 - \sin \alpha_0 \sin \delta_0\\
d' &= \cos \alpha_0 \sin \delta_0
\end{aligned}$$

Reduction to Apparent Position.

$$\alpha = \alpha_0 + \tau\mu + Aa + Bb + Cc + Dd + E \qquad \text{(in time)}$$
$$\delta = \delta_0 + \tau\mu' + Aa' + Bb' + Cc' + Dd' \qquad \text{(in arc)}$$

INDEPENDENT STAR-NUMBERS.

$$f = 46''.0866\ A + E\ \text{(in arc)} = 3^s.07244\ A + \tfrac{1}{15}\ E\ \text{(in time)}$$

$$g \sin G = B \qquad h \sin H = C \qquad i = C \tan \omega$$
$$g \cos G = 20''.0533\ A \qquad h \cos H = D$$

Reduction to Apparent Position.

$$\alpha = \alpha_0 + f + \tau\mu + \tfrac{1}{15} g \sin (G + \alpha_0) \tan \delta + \tfrac{1}{15} h \sin (H + \alpha_0) \sec \delta \qquad \text{(in time)}$$
$$\delta = \delta_0 + \tau\mu' + g \cos (G + \alpha_0) + h \cos (H + \alpha_0) \sin \delta + i \cos \delta \qquad \text{(in arc)}$$

Notes.—(1) The independent star-numbers are more convenient, when only one or two apparent positions of a star are required, or when Bessel's star-constants are not known with sufficient accuracy. Otherwise, the Besselian star-numbers are more convenient.

(2) In using the star-constants of the *British Association Catalogue*, a, b, c, d, a', b', c', d', must be changed to c, d, a, b, $-c'$, $-d'$, $-a'$, $-b'$, respectively.

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A.*	Log *B.*	Log *C.*	Log *D.*	Solar Day. (Sid. Hour.)	Log *A.*	Log *B.*	Log *C.*	Log *D.*
Jan. 0	−8.7198	+0.9870	−0.5450	+1.3029	Feb. 15	+8.9044	+0.9496	−1.1992	+1.0407
1	8.6866	0.9882	0.5837	1.3013	16	8.9213	0.9469	1.2040	1.0285
2	8.6444	0.9890	0.6192	1.2996	17	8.9334	0.9439	1.2086	1.0158
3	8.5937	0.9890	0.6518	1.2978	18	8.9408	0.9412	1.2130	1.0025
4	8.5368	0.9882	0.6820	1.2958	(10^{h}.0) 19	8.9444	0.9390	1.2172	0.9887
(7^{h}.0) 5	−8.4767	+0.9866	−0.7101	+1.2937	20	+8.9464	+0.9377	−1.2212	+0.9744
6	8.4183	0.9845	0.7364	1.2914	21	8.9479	0.9373	1.2251	0.9594
7	8.3666	0.9820	0.7611	1.2890	22	8.9510	0.9378	1.2288	0.9437
8	8.3251	0.9798	0.7843	1.2864	23	8.9567	0.9388	1.2324	0.9273
9	8.2931	0.9780	0.8062	1.2837	24	8.9660	0.9400	1.2358	0.9101
10	−8.2667	+0.9769	−0.8269	+1.2808	25	+8.9783	+0.9409	−1.2390	+0.8921
11	8.2375	0.9767	0.8465	1.2778	26	8.9927	0.9412	1.2420	0.8732
12	8.1951	0.9772	0.8651	1.2746	27	9.0074	0.9407	1.2449	0.8533
13	8.1235	0.9781	0.8829	1.2712	28	9.0209	0.9393	1.2477	0.8323
14	8.0017	0.9792	0.8998	1.2677	Mar. 1	9.0319	0.9372	1.2503	0.8101
15	−7.7745	+0.9800	−0.9159	+1.2640	2	+9.0400	+0.9345	−1.2527	+0.7866
16	−7.0864	0.9802	0.9314	1.2602	3	9.0443	0.9319	1.2551	0.7616
17	+7.5821	0.9796	0.9461	1.2561	4	9.0456	0.9296	1.2572	0.7350
18	7.9445	0.9781	0.9603	1.2519	5	9.0447	0.9280	1.2592	0.7065
19	8.1248	0.9760	0.9739	1.2475	6	9.0433	0.9273	1.2611	0.6759
(8^{h}.0) 20	+8.2333	+0.9733	−0.9869	+1.2430	(11^{h}.0) 7	+9.0426	+0.9276	−1.2629	+0.6428
21	8.3015	0.9705	0.9994	1.2382	8	9.0438	0.9287	1.2645	0.6069
22	8.3448	0.9680	1.0114	1.2333	9	9.0484	0.9302	1.2659	0.5676
23	8.3722	0.9662	1.0230	1.2281	10	9.0564	0.9318	1.2672	0.5243
24	8.3927	0.9651	1.0341	1.2228	11	9.0671	0.9330	1.2684	0.4760
25	+8.4130	+0.9649	−1.0448	+1.2173	12	+9.0800	+0.9334	−1.2695	+0.4216
26	8.4389	0.9654	1.0551	1.2115	13	9.0929	0.9330	1.2704	0.3593
27	8.4732	0.9662	1.0650	1.2055	14	9.1048	0.9317	1.2712	0.2864
28	8.5147	0.9670	1.0746	1.1993	15	9.1146	0.9298	1.2718	0.1986
29	8.5607	0.9675	1.0839	1.1929	16	9.1218	0.9275	1.2723	0.0885
30	+8.6069	+0.9673	−1.0928	+1.1863	17	+9.1260	+0.9253	−1.2727	+9.9404
31	8.6495	0.9662	1.1014	1.1794	18	9.1277	0.9236	1.2730	9.7138
Feb. 1	8.6857	0.9643	1.1097	1.1723	19	9.1279	0.9228	1.2731	+9.2127
2	8.7139	0.9617	1.1177	1.1649	20	9.1277	0.9229	1.2731	−9.2808
3	8.7342	0.9588	1.1254	1.1573	21	9.1280	0.9239	1.2730	9.7362
(9^{h}.0) 4	+8.7468	+0.9559	−1.1328	+1.1493	(12^{h}.0) 22	+9.1303	+0.9257	−1.2727	−9.9533
5	8.7532	0.9534	1.1400	1.1411	23	9.1348	0.9278	1.2723	0.0973
6	8.7564	0.9517	1.1470	1.1326	24	9.1417	0.9297	1.2718	0.2051
7	8.7590	0.9509	1.1537	1.1238	25	9.1505	0.9311	1.2711	0.2913
8	8.7636	0.9509	1.1601	1.1147	26	9.1601	0.9318	1.2703	0.3629
9	+8.7729	+0.9515	−1.1663	+1.1053	27	+9.1694	+0.9315	−1.2694	−0.4243
10	8.7883	0.9525	1.1723	1.0955	28	9.1775	0.9304	1.2684	0.4779
11	8.8068	0.9532	1.1781	1.0853	29	9.1834	0.9287	1.2672	0.5255
12	8.8332	0.9535	1.1837	1.0748	30	9.1871	0.9269	1.2659	0.5682
13	8.8587	0.9531	1.1890	1.0639	31	9.1883	0.9253	1.2645	0.6070
14	+8.8830	+0.9518	−1.1942	+1.0525	32	+9.1882	+0.9243	−1.2629	−0.6494
15	+8.9044	+0.9496	−1.1992	+1.0407	33	+9.1870	+0.9242	−1.2612	−0.6750

$E = -0.''01$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
Apr. 1	+9.1882	+0.9243	−1.2629	−0.6424	May 17	+9.3964	+0.9603	−1.0074	−1.2350
2	9.1870	0.9242	1.2612	0.6750	18	9.4027	0.9626	0.9959	1.2396
3	9.1861	0.9251	1.2593	0.7053	19	9.4099	0.9643	0.9839	1.2440
4	9.1865	0.9269	1.2573	0.7334	20	9.4173	9.9651	0.9715	1.2483
5	9.1892	0.9292	1.2552	0.7597	21	9.4245	0.9651	0.9586	1.2525
$(13^{h}.0)$ 6	+9.1944	+0.9317	−1.2530	−0.7843	$(16^{h}.0)$ 22	+9.4307	+0.9643	−0.9452	−1.2564
7	9.2019	0.9339	1.2506	0.8075	23	9.4357	0.9630	0.9313	1.2602
8	9.2112	0.9355	1.2481	0.8294	24	9.4394	0.9617	0.9167	1.2638
9	9.2211	0.9362	1.2454	0.8501	25	9.4418	0.9607	0.9015	1.2673
10	9.2308	0.9360	1.2426	0.8697	26	9.4434	0.9604	0.8857	1.2707
11	+9.2393	+0.9351	−1.2396	−0.8883	27	+9.4448	+0.9608	−0.8691	−1.2739
12	9.2459	0.9337	1.2365	0.9061	28	9.4466	0.9621	0.8518	1.2769
13	9.2504	0.9323	1.2332	0.9230	29	9.4492	0.9641	0.8337	1.2798
14	9.2530	0.9312	1.2298	0.9391	30	9.4531	0.9664	0.8146	1.2826
15	9.2542	0.9308	1.2263	0.9546	31	9.4585	0.9686	0.7945	1.2852
16	+9.2549	+0.9314	−1.2226	−0.9693	June 1	+9.4649	+0.9705	−0.7733	−1.2877
17	9.2559	0.9330	1.2187	0.9835	2	9.4722	0.9716	0.7509	1.2900
18	9.2580	0.9352	1.2147	0.9971	3	9.4796	0.9718	0.7272	1.2923
19	9.2618	0.9379	1.2105	1.0101	4	9.4867	0.9712	0.7020	1.2943
20	9.2674	0.9406	1.2061	1.0226	5	9.4929	0.9700	0.6751	1.2963
$(14^{h}.0)$ 21	+9.2747	+0.9428	−1.2016	−1.0347	$(17^{h}.0)$ 6	+9.4980	+0.9684	−0.6463	−1.2981
22	9.2830	0.9443	1.1969	1.0463	7	9.5020	0.9668	0.6153	1.2998
23	9.2912	0.9450	1.1920	1.0575	8	9.5049	0.9657	0.5819	1.3014
24	9.2988	0.9448	1.1869	1.0682	9	9.5072	0.9653	0.5455	1.3028
25	9.3051	0.9439	1.1817	1.0786	10	9.5093	0.9657	0.5057	1.3042
26	+9.3096	+0.9427	−1.1763	−1.0886	11	+9.5118	+0.9669	−0.4617	−1.3054
27	9.3124	0.9415	1.1707	1.0983	12	9.5150	0.9687	0.4126	1.3064
28	9.3137	0.9409	1.1649	1.1076	13	9.5191	0.9706	0.3572	1.3074
29	9.3143	0.9410	1.1588	1.1166	14	9.5242	0.9724	0.2935	1.3082
30	9.3147	0.9421	1.1526	1.1253	15	9.5301	0.9736	0.2187	1.3089
May 1	+9.3160	+0.9440	−1.1462	−1.1336	16	+9.5362	+0.9741	−0.1281	−1.3095
2	9.3186	0.9465	1.1395	1.1417	17	9.5423	0.9737	0.0133	1.3099
3	9.3232	0.9492	1.1326	1.1496	18	9.5477	0.9725	9.8569	1.3103
4	9.3296	0.9518	1.1255	1.1571	19	9.5521	0.9707	9.6097	1.3105
5	9.3375	0.9539	1.1182	1.1644	20	9.5558	0.9687	−8.9768	1.3106
6	+9.3461	+0.9551	−1.1106	−1.1715	$(18^{h}.0)$ 21	+9.5583	+0.9669	+9.3168	−1.3106
$(15^{h}.0)$ 7	9.3548	0.9555	1.1027	1.1783	22	9.5601	0.9656	9.7230	1.3104
8	9.3628	0.9551	1.0945	1.1849	23	9.5615	0.9651	9.9250	1.3102
9	9.3695	0.9541	1.0861	1.1913	24	9.5629	0.9654	0.0619	1.3098
10	9.3747	0.9529	1.0774	1.1975	25	9.5649	0.9664	0.1657	1.3093
11	+9.3784	+0.9519	−1.0684	−1.2034	26	+9.5678	+0.9679	+0.2493	−1.3086
12	9.3810	0.9515	1.0591	1.2091	27	9.5717	0.9694	0.3193	1.3079
13	9.3830	0.9519	1.0495	1.2147	28	9.5766	0.9707	0.3794	1.3070
14	9.3849	0.9532	1.0395	1.2200	29	9.5821	0.9713	0.4322	1.3060
15	9.3875	0.9552	1.0292	1.2252	30	9.5880	0.9711	0.4791	1.3049
16	+9.3913	+0.9577	−1.0185	−1.2302	31	+9.5937	+0.9700	+0.5213	−1.3037
17	+9.3964	+0.9603	−1.0074	−1.2350	32	+9.5989	+0.9682	+0.5596	−1.3023

$E = -0''.02$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A.*	Log *B.*	Log *C.*	Log *D.*	Solar Day. (Sid. Hour.)	Log *A.*	Log *B.*	Log *C.*	Log *D.*
July 1	+9.5937	+0.9700	+0.5213	−1.3037	Aug. 16	+9.7132	+0.9211	+1.1821	−1.0779
2	9.5989	0.9682	0.5596	1.3023	17	9.7132	0.9200	1.1873	1.0676
3	9.6032	0.9659	0.5948	1.3008	18	9.7134	0.9198	1.1923	1.0569
4	9.6066	0.9635	0.6272	1.2992	19	9.7140	0.9204	1.1971	1.0458
5	9.6091	0.9614	0.6572	1.2975	20	9.7153	0.9214	1.2017	1.0343
(19^{h}.0) 6	+9.6110	+0.9599	+0.6852	−1.2956	(22^{h}.0) 21	+9.7174	+0.9224	+1.2062	−1.0224
7	9.6126	0.9593	0.7113	1.2936	22	9.7201	0.9230	1.2105	1.0100
8	9.6143	0.9595	0.7359	1.2915	23	9.7232	0.9228	1.2147	0.9971
9	9.6165	0.9604	0.7590	1.2892	24	9.7264	0.9216	1.2186	0.9837
10	9.6194	0.9616	0.7809	1.2868	25	9.7295	0.9196	1.2225	0.9697
11	+9.6231	+0.9628	+0.8016	−1.2843	26	+9.7320	+0.9169	+1.2261	−0.9551
12	9.6274	0.9635	0.8212	1.2816	27	9.7340	0.9138	1.2297	0.9399
13	9.6320	0.9635	0.8399	1.2789	28	9.7352	0.9109	1.2331	0.9239
14	9.6367	0.9627	0.8577	1.2759	29	9.7359	0.9085	1.2363	0.9073
15	9.6411	0.9609	0.8747	1.2728	30	9.7361	0.9069	1.2394	0.8898
16	+9.6447	+0.9585	+0.8909	−1.2696	31	+9.7363	+0.9063	+1.2423	−0.8715
17	9.6476	0.9558	0.9064	1.2662	Sept. 1	9.7367	0.9067	1.2451	0.8522
18	9.6495	0.9531	0.9213	1.2627	2	9.7375	0.9078	1.2478	0.8319
19	9.6507	0.9509	0.9356	1.2590	3	9.7389	0.9092	1.2503	0.8104
20	9.6516	0.9493	0.9493	1.2552	4	9.7409	0.9104	1.2527	0.7877
21	+9.6523	+0.9487	+0.9624	−1.2513	(23^{h}.0) 5	+9.7433	+0.9110	+1.2549	−0.7636
(20^{h}.0) 22	9.6534	0.9489	0.9751	1.2471	6	9.7460	0.9108	1.2570	0.7379
23	9.6550	0.9497	0.9873	1.2428	7	9.7485	0.9097	1.2590	0.7105
24	9.6575	0.9507	0.9990	1.2383	8	9.7507	0.9076	1.2608	0.6811
25	9.6608	0.9515	1.0104	1.2337	9	9.7524	0.9050	1.2625	0.6494
26	+9.6648	+0.9518	+1.0213	−1.2289	10	+9.7534	+0.9022	+1.2641	−0.6149
27	9.6691	0.9513	1.0318	1.2239	11	9.7537	0.8997	1.2656	0.5775
28	9.6734	0.9499	1.0420	1.2188	12	9.7536	0.8979	1.2669	0.5362
29	9.6774	0.9476	1.0518	1.2134	13	9.7532	0.8970	1.2681	0.4905
30	9.6807	0.9448	1.0613	1.2078	14	9.7529	0.8972	1.2692	0.4393
31	+9.6833	+0.9418	+1.0705	−1.2021	15	+9.7530	+0.8983	+1.2701	−0.3810
Aug. 1	9.6851	0.9389	1.0793	1.1962	16	9.7536	0.9000	1.2709	0.3134
2	9.6863	0.9367	1.0879	1.1900	17	9.7549	0.9018	1.2716	0.2333
3	9.6871	0.9352	1.0962	1.1837	18	9.7568	0.9033	1.2722	0.1345
4	9.6880	0.9348	1.1042	1.1771	19	9.7593	0.9041	1.2726	0.0064
5	+9.6891	+0.9351	+1.1119	−1.1703	(0^{h}.0) 20	+9.7619	+0.9040	+1.2729	−9.8235
(21^{h}.0) 6	9.6908	0.9359	1.1194	1.1632	21	9.7645	0.9029	1.2731	−9.5006
7	9.6932	0.9368	1.1267	1.1559	22	9.7668	0.9011	1.2731	+8.5172
8	9.6961	0.9374	1.1337	1.1484	23	9.7685	0.8988	1.2731	9.5826
9	9.6995	0.9374	1.1405	1.1406	24	9.7696	0.8965	1.2729	9.8646
10	+9.7029	+0.9365	+1.1470	−1.1325	25	+9.7702	+0.8946	+1.2725	+0.0342
11	9.7061	0.9347	1.1534	1.1242	26	9.7704	0.8936	1.2721	0.1558
12	9.7089	0.9321	1.1595	1.1156	27	9.7704	0.8935	1.2715	0.2506
13	9.7110	0.9290	1.1655	1.1066	28	9.7705	0.8945	1.2708	0.3288
14	9.7124	0.9259	1.1712	1.0974	29	9.7710	0.8963	1.2699	0.3942
15	+9.7130	+0.9231	+1.1768	−1.0878	30	+9.7720	+0.8986	+1.2689	+0.4513
16	+9.7132	+0.9211	+1.1821	−1.0779	31	+9.7736	+0.9008	+1.2678	+0.5017

$E = -0''.02$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
Oct. 1	+9.7736	+0.9008	+1.2678	+0.5017	Nov. 16	+9.8429	+0.9290	+1.0337	+1.2230
2	9.7757	0.9026	1.2666	0.5467	17	9.8449	0.9277	1.0226	1.2283
3	9.7781	0.9036	1.2652	0.5874	18	9.8464	0.9265	1.0111	1.2334
4	9.7805	0.9036	1.2637	0.6246	19	9.8476	0.9258	0.9992	1.2383
5	9.7827	0.9028	1.2621	0.6586	($4^h.0$) 20	9.8484	0.9259	0.9868	1.2430
($1^h.0$) 6	+9.7844	+0.9012	+1.2603	+0.6901	21	+9.8493	+0.9269	+0.9738	+1.2476
7	9.7855	0.8993	1.2584	0.7194	22	9.8503	0.9288	0.9603	1.2519
8	9.7860	0.8976	1.2563	0.7467	23	9.8517	0.9312	0.9463	1.2561
9	9.7861	0.8964	1.2541	0.7723	24	9.8536	0.9339	0.9316	1.2601
10	9.7859	0.8961	1.2518	0.7964	25	9.8560	0.9363	0.9162	1.2639
11	+9.7857	+0.8969	+1.2493	+0.8191	26	+9.8587	+0.9382	+0.9002	+1.2676
12	9.7857	0.8986	1.2467	0.8405	27	9.8616	0.9392	0.8834	1.2711
13	9.7862	0.9011	1.2439	0.8608	28	9.8644	0.9392	0.8658	1.2745
14	9.7874	0.9038	1.2409	0.8801	29	9.8670	0.9384	0.8473	1.2777
15	9.7892	0.9063	1.2378	0.8985	30	9.8692	0.9370	0.8278	1.2807
16	+9.7915	+0.9082	+1.2346	+0.9160	Dec. 1	+9.8708	+0.9354	+0.8072	+1.2836
17	9.7941	0.9093	1.2312	0.9327	2	9.8720	0.9341	0.7855	1.2863
18	9.7968	0.9094	1.2277	0.9487	3	9.8728	0.9333	0.7624	1.2889
19	9.7993	0.9087	1.2240	0.9640	4	9.8735	0.9334	0.7380	1.2913
20	9.8013	0.9073	1.2201	0.9786	5	9.8742	0.9344	0.7119	1.2936
($2^h.0$) 21	+9.8028	+0.9058	+1.2160	+0.9926	($5^h.0$) 6	+9.8752	+0.9361	+0.6840	+1.2957
22	9.8037	0.9046	1.2118	1.0061	7	9.8766	0.9383	0.6540	1.2977
23	9.8043	0.9041	1.2074	1.0191	8	9.8786	0.9405	0.6217	1.2995
24	9.8047	0.9045	1.2028	1.0316	9	9.8810	0.9424	0.5865	1.3012
25	9.8051	0.9059	1.1980	1.0436	10	9.8839	0.9436	0.5482	1.3028
26	+9.8057	+0.9081	+1.1931	+1.0551	11	+9.8869	+0.9438	+0.5060	+1.3042
27	9.8069	0.9109	1.1879	1.0662	12	9.8898	0.9432	0.4590	1.3054
28	9.8086	0.9139	1.1826	1.0770	13	9.8924	0.9417	0.4062	1.3066
29	9.8108	0.9164	1.1770	1.0873	14	9.8947	0.9398	0.3458	1.3075
30	9.8133	0.9183	1.1713	1.0973	15	9.8965	0.9378	0.2755	1.3084
31	+9.8160	+0.9192	+1.1653	+1.1070	16	+9.8979	+0.9362	+0.1915	+1.3091
Nov. 1	9.8185	0.9192	1.1591	1.1163	17	9.8991	0.9353	0.0871	1.3097
2	9.8207	0.9184	1.1526	1.1252	18	9.9001	0.9352	9.9490	1.3101
3	9.8224	0.9172	1.1460	1.1339	19	9.9012	0.9360	9.7450	1.3104
4	9.8235	0.9160	1.1391	1.1423	20	9.9026	0.9374	+9.3477	1.3106
($3^h.0$) 5	+9.8242	+0.9151	+1.1319	+1.1504	($6^h.0$) 21	+9.9043	+0.9392	−9.0449	+1.3106
6	9.8245	0.9150	1.1245	1.1582	22	9.9065	0.9409	9.6478	1.3105
7	9.8247	0.9159	1.1168	1.1657	23	9.9091	0.9421	9.8909	1.3102
8	9.8251	0.9177	1.1089	1.1730	24	9.9118	0.9425	0.0457	1.3098
9	9.8259	0.9202	1.1006	1.1801	25	9.9145	0.9419	0.1595	1.3093
10	+9.8273	+0.9230	+1.0921	+1.1869	26	+9.9171	+0.9405	−0.2495	+1.3086
11	9.8292	0.9258	1.0832	1.1934	27	9.9193	0.9384	0.3239	1.3078
12	9.8317	0.9282	1.0740	1.1998	28	9.9210	0.9359	0.3872	1.3069
13	9.8346	0.9297	1.0645	1.2059	29	9.9222	0.9335	0.4424	1.3058
14	9.8375	0.9303	1.0546	1.2118	30	9.9231	0.9315	0.4912	1.3046
15	+9.8404	+0.9300	+1.0443	+1.2175	31	+9.9238	+0.9304	−0.5350	+1.3032
16	+9.8429	+0.9290	+1.0337	+1.2230	32	+9.9244	+0.9301	−0.5746	+1.3017

$E = -0''.02$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
Jan. 0	0.0022	−2.43	−0.162	96 11	6 24.7	350 6	23 20.4	+0.9895	+1.3094	−1.52	−0.1819
1	0.0049	2.25	0.150	95 43	6 22.9	349 9	23 16.6	0.9904	1.3092	1.66	0.2208
2	0.0076	2.04	0.136	95 11	6 20.7	348 13	23 12.9	0.9908	1.3089	1.80	0.2563
3	0.0104	1.82	0.121	94 37	6 18.5	347 16	23 9.1	0.9904	1.3086	1.95	0.2899
4	0.0131	1.59	0.106	94 3	6 16.2	346 19	23 5.3	0.9893	1.3083	2.09	0.3191
($7^{h}.0$) 5	0.0159	−1.39	−0.093	93 33	6 14.2	345 23	23 1.5	+0.9874	+1.3080	−2.22	−0.3473
6	0.0186	1.22	0.081	93 7	6 12.5	344 26	22 57.7	0.9851	1.3077	2.36	0.3736
7	0.0213	1.08	0.072	92 47	6 11.1	343 29	22 53.9	0.9825	1.3073	2.50	0.3984
8	0.0241	0.98	0.065	92 33	6 10.2	342 32	22 50.1	0.9802	1.3069	2.64	0.4215
9	0.0268	0.91	0.061	92 22	6 9.5	341 35	22 46.3	0.9783	1.3066	2.78	0.4434
10	0.0295	−0.86	−0.057	92 14	6 8.9	340 38	22 42.5	+0.9772	+1.3061	−2.91	−0.4641
11	0.0323	0.80	0.053	92 5	6 8.3	339 41	22 38.7	0.9770	1.3057	3.05	0.4838
12	0.0350	0.73	0.049	91 54	6 7.6	338 43	22 34.9	0.9774	1.3053	3.18	0.5025
13	0.0378	0.62	0.041	91 36	6 6.4	337 46	22 31.1	0.9783	1.3048	3.31	0.5202
14	0.0405	0.47	0.031	91 13	6 4.9	336 48	22 27.2	0.9793	1.3043	3.44	0.5371
15	0.0432	−0.28	−0.019	90 43	6 2.9	335 50	22 23.3	+0.9800	+1.3038	−3.58	−0.5533
16	0.0460	−0.06	−0.004	90 9	6 0.6	334 52	22 19.5	0.9802	1.3033	3.70	0.5687
17	0.0487	+0.17	+0.011	89 32	5 58.1	333 54	22 15.6	0.9796	1.3028	3.83	0.5835
18	0.0514	0.40	0.027	88 56	5 55.7	332 56	22 11.7	0.9782	1.3023	3.96	0.5975
19	0.0542	0.61	0.041	88 23	5 53.5	331 58	22 7.9	0.9761	1.3017	4.09	0.6112
($8^{h}.0$) 20	0.0569	+0.78	+0.052	87 55	5 51.7	330 59	22 3.9	+0.9736	+1.3012	−4.21	−0.6242
21	0.0597	0.92	0.061	87 32	5 50.1	330 1	22 0.1	0.9709	1.3006	4.33	0.6367
22	0.0624	1.01	0.068	87 16	5 49.1	329 2	21 56.1	0.9685	1.3000	4.46	0.6488
23	0.0651	1.08	0.072	87 5	5 48.3	328 3	21 52.2	0.9668	1.2994	4.58	0.6604
24	0.0679	1.13	0.075	86 56	5 47.7	327 4	21 48.3	0.9657	1.2988	4.69	0.6715
25	0.0706	+1.19	+0.079	86 47	5 47.1	326 5	21 44.3	+0.9656	+1.2982	−4.81	−0.6822
26	0.0733	1.26	0.084	86 35	5 46.3	325 6	21 40.4	0.9661	1.2976	4.93	0.6925
27	0.0761	1.36	0.091	86 19	5 45.3	324 7	21 36.5	0.9671	1.2970	5.04	0.7024
28	0.0788	1.50	0.099	85 57	5 43.8	323 7	21 32.5	0.9681	1.2963	5.15	0.7120
29	0.0816	1.67	0.111	85 30	5 42.0	322 7	21 28.5	0.9689	1.2957	5.26	0.7213
30	0.0843	+1.86	+0.124	85 0	5 40.0	321 7	21 24.5	+0.9689	+1.2951	−5.37	−0.7302
31	0.0870	2.05	0.137	84 29	5 37.9	320 7	21 20.5	0.9682	1.2944	5.48	0.7388
Feb. 1	0.0898	2.23	0.149	83 59	5 35.9	319 7	21 16.5	0.9667	1.2937	5.59	0.7471
2	0.0925	2.38	0.159	83 32	5 34.1	318 6	21 12.4	0.9645	1.2931	5.69	0.7551
3	0.0953	2.49	0.166	83 12	5 32.8	317 6	21 8.4	0.9619	1.2924	5.79	0.7628
($9^{h}.0$) 4	0.0980	+2.57	+0.171	82 56	5 31.7	316 5	21 4.3	+0.9592	+1.2918	−5.89	−0.7703
5	0.1007	2.60	0.174	82 48	5 31.2	315 4	21 0.3	0.9569	1.2911	5.99	0.7774
6	0.1035	2.62	0.175	82 43	5 30.9	314 3	20 56.2	0.9552	1.2904	6.09	0.7844
7	0.1062	2.64	0.176	82 39	5 30.6	313 2	20 52.1	0.9545	1.2898	6.18	0.7910
8	0.1089	2.67	0.178	82 35	5 30.3	312 1	20 48.1	0.9545	1.2891	6.28	0.7976
9	0.1117	+2.72	+0.182	82 26	5 29.7	310 59	20 43.9	+0.9553	+1.2885	−6.37	−0.8038
10	0.1144	2.82	0.188	82 11	5 28.7	309 58	20 39.9	0.9565	1.2878	6.45	0.8097
11	0.1172	2.96	0.197	81 49	5 27.3	308 56	20 35.7	0.9577	1.2872	6.55	0.8155
12	0.1199	3.13	0.209	81 23	5 25.5	307 53	20 31.5	0.9585	1.2865	6.62	0.8211
13	0.1226	3.32	0.221	80 50	5 23.3	306 51	20 27.4	0.9587	1.2859	6.71	0.8265
14	0.1254	+3.51	+0.234	80 18	5 21.2	305 49	20 23.3	+0.9580	+1.2852	−6.79	−0.8316
15	0.1281	+3.69	+0.246	79 46	5 19.1	304 46	20 19.1	+0.9566	+1.2846	−6.86	−0.8366

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
Feb. 15	0.1281	+3.69	+0.246	79 46	5 19.1	304 46	20 19.1	+0.9566	+1.2846	−6.86	−0.8366
16	0.1308	3.83	0.256	79 18	5 17.2	303 44	20 14.9	0.9545	1.2840	6.94	0.8414
17	0.1336	3.94	0.263	78 56	5 15.7	302 41	20 10.7	0.9521	1.2834	7.01	0.8459
18	0.1363	4.01	0.267	78 41	5 14.7	301 38	20 6.5	0.9497	1.2828	7.08	0.8503
($10^{h}.0$) 19	0.1391	4.05	0.270	78 31	5 14.1	300 35	20 2.3	0.9478	1.2822	7.15	0.8546
20	0.1418	+4.06	+0.271	78 27	5 13.8	299 32	19 58.1	+0.9466	+1.2817	−7.22	−0.8586
21	0.1445	4.08	0.272	78 24	5 13.6	298 28	19 53.9	0.9463	1.2811	7.29	0.8626
22	0.1473	4.11	0.274	78 20	5 13.3	297 25	19 49.7	0.9469	1.2805	7.35	0.8663
23	0.1500	4.16	0.278	78 12	5 12.8	296 21	19 45.4	0.9481	1.2800	7.41	0.8698
24	0.1527	4.25	0.283	77 59	5 11.9	295 17	19 41.1	0.9496	1.2795	7.47	0.8732
25	0.1555	+4.37	+0.292	77 41	5 10.7	294 13	19 36.9	+0.9510	+1.2790	−7.52	−0.8764
26	0.1582	4.52	0.301	77 17	5 9.1	293 9	19 32.6	0.9520	1.2785	7.58	0.8794
27	0.1610	4.68	0.312	76 51	5 7.4	292 5	19 28.3	0.9523	1.2781	7.63	0.8824
28	0.1637	4.82	0.322	76 24	5 5.6	291 1	19 24.1	0.9517	1.2776	7.68	0.8851
Mar. 1	0.1664	4.95	0.330	76 0	5 4.0	289 57	19 19.8	0.9503	1.2772	7.72	0.8877
2	0.1692	+5 04	+0.336	75 40	5 2.7	288 53	19 15.5	+0.9483	+1.2768	−7.76	−0.8898
3	0.1719	5.09	0.340	75 26	5 1.7	287 48	19 11.2	0.9461	1.2764	7.81	0.8925
4	0.1747	5.11	0.341	75 20	5 1.3	286 44	19 6.9	0.9440	1.2760	7.85	0.8947
5	0.1774	5.10	0.340	75 18	5 1.2	285 39	19 2.6	0.9424	1.2756	7.89	0.8968
6	0.1801	5.08	0.339	75 20	5 1.3	284 34	18 58.3	0.9417	1.2753	7.92	0.8985
($11^{h}.0$) 7	0.1829	+5.07	+0.338	75 22	5 1.5	283 30	18 54.0	+0.9420	+1.2750	−7.95	−0.9003
8	0.1856	5.09	0.339	75 23	5 1.5	282 25	18 49.7	0.9430	1.2747	7.98	0.9019
9	0.1883	5.14	0.343	75 16	5 1.1	281 20	18 45.3	0.9448	1.2745	8.00	0.9033
10	0.1911	5.24	0.349	75 3	5 0.2	280 15	18 41.0	0.9467	1.2742	8.03	0.9046
11	0.1938	5.37	0.358	74 44	4 58.9	279 10	18 36.7	0.9486	1.2740	8.05	0.9059
12	0.1966	+5.53	+0.309	74 19	4 57.3	278 5	18 32.3	+0.9499	+1.2738	−8.07	−0.9069
13	0.1993	5.70	0.380	73 51	4 55.4	277 0	18 28.0	0.9505	1.2736	8.09	0.9078
14	0.2020	5.85	0.390	73 22	4 53.5	275 55	18 23.7	0.9503	1.2735	8.10	0.9086
15	0.2048	5.99	0.399	72 57	4 51.8	274 50	18 19.3	0.9493	1.2734	8.12	0.9093
16	0.2075	6.09	0.406	72 35	4 50.3	273 45	18 15.0	0.9479	1.2733	8.13	0.9098
17	0.2102	+6.15	+0.410	72 21	4 49.4	272 40	18 10.7	+0.9462	+1.2732	−8.13	−0.9101
18	0.2130	6.17	0.411	72 13	4 48.9	271 35	18 6.3	0.9449	1.2732	8.13	0.9103
19	0.2157	6.17	0.412	72 11	4 48.7	270 30	18 2.0	0.9441	1.2731	8.14	0.9105
20	0.2185	6.17	0.412	72 12	4 48.8	269 25	17 57.7	0.9442	1.2731	8.14	0.9106
21	0.2212	6.18	0.412	72 13	4 48.9	268 20	17 53.3	0.9452	1.2732	8.14	0.9104
($12^{h}.0$) 22	0.2239	+6.21	+0.414	72 12	4 48.8	267 15	17 49.0	+0.9470	+1.2732	−8.13	−0.9101
23	0.2267	6.27	0.418	72 6	4 48.4	266 11	17 44.7	0.9493	1.2733	8.12	0.9097
24	0.2294	6.37	0.425	71 55	4 47.7	265 6	17 40.4	0.9517	1.2734	8.11	0.9092
25	0.2321	6.50	0.433	71 37	4 46.5	264 1	17 36.1	0.9539	1.2735	8.10	0.9086
26	0.2349	6.65	0.443	71 16	4 45.1	262 57	17 31.8	0.9554	1.2737	8.09	0.9078
27	0.2376	+6.79	+0.453	70 53	4 43.5	261 52	17 27.5	+0.9561	+1.2738	−8.07	−0.9069
28	0.2404	6.92	0.461	70 30	4 42.0	260 48	17 23.2	0.9560	1.2740	8.05	0.9059
29	0.2431	7.02	0.468	70 11	4 40.7	259 44	17 18.9	0.9553	1.2742	8.03	0.9047
30	0.2458	7.08	0.472	69 57	4 39.8	258 40	17 14.7	0.9540	1.2745	8.00	0.9033
31	0.2486	7.10	0.473	69 49	4 39.3	257 35	17 10.3	0.9528	1.2747	7.98	0.9019
32	0.2513	+7.09	+0.473	69 48	4 39.2	256 31	17 6.1	+0.9519	+1.2750	−7.95	−0.9003
33	0.2541	+7.07	+0.471	69 50	4 39.3	255 28	17 1.9	+0.9517	+1.2753	−7.92	−0.8986

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
Apr. 1	0.2513	+ 7.09	+0.473	69 48	4 39.2	256 31	17 6.1	+0.9519	+1.2750	−7.95	−0.9003
2	0.2541	7.07	0.471	69 50	4 39.3	255 28	17 1.9	0.9517	1.2753	7.92	0.8986
3	0.2568	7.06	0.471	69 55	4 39.7	254 24	16 57.6	0.9524	1.2756	7.88	0.8968
4	0.2595	7.07	0.471	69 58	4 39.9	253 20	16 53.3	0.9540	1.2760	7.85	0.8947
5	0.2623	7.11	0.474	69 58	4 39.9	252 17	16 49.1	0.9563	1.2763	7.81	0.8926
$(13^{h}.0)$ 6	0.2650	+ 7.20	+0.480	69 50	4 39.3	251 14	16 44.9	+0.9590	+1.2767	−7.77	−0.8904
7	0.2677	7.32	0.488	69 37	4 38.5	250 11	16 40.7	0.9620	1.2771	7.73	0.8880
8	0.2705	7.48	0.499	69 17	4 37.1	249 8	16 36.5	0.9645	1.2775	7.68	0.8855
9	0.2732	7.65	0.510	68 52	4 35.5	248 5	16 32.3	0.9664	1.2780	7.64	0.8828
10	0.2760	7.83	0.522	68 26	4 33.7	247 2	16 28.1	0.9675	1.2784	7.59	0.8800
11	0.2787	+ 7.98	+0.532	68 0	4 32.0	246 0	16 24.0	+0.9679	+1.2789	−7.53	−0.8770
12	0.2814	8.10	0.540	67 38	4 30.5	244 57	16 19.8	0.9677	1.2794	7.48	0.8739
13	0.2842	8.19	0.546	67 22	4 29.5	243 55	16 15.7	0.9671	1.2799	7.43	0.8707
14	0.2869	8.24	0.549	67 11	4 28.7	242 53	16 11.5	0.9666	1.2804	7.37	0.8673
15	0.2896	8.26	0.551	67 7	4 28.5	241 52	16 7.5	0.9665	1.2809	7.31	0.8637
16	0.2924	+ 8.27	+0.551	67 7	4 28.5	240 50	16 3.3	+0.9671	+1.2815	−7.25	−0.8600
17	0.2951	8.29	0.553	67 8	4 28.5	239 49	15 59.3	0.9685	1.2820	7.18	0.8561
18	0.2979	8.33	0.555	67 8	4 28.5	238 47	15 55.1	0.9707	1.2826	7.11	0.8521
19	0.3006	8.40	0.560	67 5	4 28.3	237 46	15 51.1	0.9736	1.2831	7.05	0.8479
20	0.3033	8.51	0.567	66 57	4 27.8	236 46	15 47.1	0.9767	1.2837	6.98	0.8436
$(14^{h}.0)$ 21	0.3061	+ 8.65	+0.577	66 42	4 26.8	235 45	15 43.0	+0.9797	+1.2843	−6.90	−0.8390
22	0.3088	8.82	0.588	66 23	4 25.5	234 44	15 38.9	0.9823	1.2849	6.83	0.8343
23	0.3115	8.99	0.599	66 2	4 24.1	233 44	15 34.9	0.9842	1.2855	6.75	0.8295
24	0.3143	9.15	0.610	65 38	4 22.5	232 44	15 30.9	0.9853	1.2861	6.67	0.8244
25	0.3170	9.29	0.619	65 16	4 21.1	231 44	15 26.9	0.9857	1.2868	6.59	0.8191
26	0.3198	+ 9.38	+0.625	64 59	4 19.9	230 45	15 23.0	+0.9855	+1.2874	−6.51	−0.8137
27	0.3225	9.44	0.629	64 47	4 19.1	229 45	15 19.0	0.9850	1.2880	6.43	0.8081
28	0.3252	9.47	0.631	64 41	4 18.7	228 46	15 15.1	0.9847	1.2886	6.34	0.8022
29	0.3280	9.48	0.632	64 40	4 18.7	227 47	15 11.1	0.9849	1.2892	6.26	0.7963
30	0.3307	9.50	0.633	64 41	4 18.7	226 48	15 7.2	0.9859	1.2899	6.17	0.7900
May 1	0.3335	+ 9.52	+0.635	64 43	4 18.9	225 50	15 3.3	+0.9877	+1.2905	−6.08	−0.7836
2	0.3362	9.58	0.639	64 44	4 18.9	224 51	14 59.4	0.9902	1.2911	5.99	0.7770
3	0.3389	9.68	0.645	64 37	4 18.5	223 53	14 55.5	0.9933	1.2918	5.89	0.7701
4	0.3417	9.83	0.655	64 26	4 17.7	222 55	14 51.7	0.9966	1.2924	5.79	0.7629
5	0.3444	10.01	0.667	64 8	4 16.5	221 57	14 47.8	0.9997	1.2930	5.70	0.7555
6	0.3471	+10.21	+0.681	63 45	4 15.0	221 0	14 44.0	+1.0024	+1.2937	−5.60	−0.7480
$(15^{h}.0)$ 7	0.3499	10.41	0.694	63 18	4 13.2	220 2	14 40.1	1.0045	1.2943	5.50	0.7401
8	0.3526	10.61	0.707	62 51	4 11.4	219 5	14 36.3	1.0058	1.2949	5.40	0.7320
9	0.3554	10.77	0.718	62 26	4 9.7	218 8	14 32.5	1.0064	1.2955	5.29	0.7236
10	0.3581	10.90	0.727	62 6	4 8.4	217 11	14 28.7	1.0066	1.2962	5.19	0.7148
11	0.3608	+11.00	+0.733	61 50	4 7.3	216 14	14 24.9	+1.0067	+1.2968	−5.08	−0.7058
12	0.3635	11.06	0.737	61 40	4 6.7	215 18	14 21.2	1.0069	1.2974	4.97	0.6966
13	0.3663	11.11	0.741	61 35	4 6.3	214 21	14 17.4	1.0076	1.2979	4.86	0.6869
14	0.3690	11.16	0.744	61 33	4 6.2	213 25	14 13.7	1.0091	1.2985	4.75	0.6769
15	0.3718	11.23	0.748	61 31	4 6.1	212 29	14 9.9	1.0112	1.2991	4.64	0.6666
16	0.3745	+11.33	+0.755	61 27	4 5.8	211 33	14 6.2	+1.0140	+1.2997	−4.53	−0.6558
17	0.3773	+11.46	+0.764	61 18	4 5.2	210 38	14 2.5	+1.0172	+1.3002	−4.41	−0.6448

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	*f*		*G*		*H*		Log *g*.	Log *h*.	*i*	Log *i*.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
May 17	0.3773	+11.46	+0.764	61 18	4 5.2	210 38	14 2.5	+1.0172	+1.3002	−4.41	−0.6448
18	0.3800	11.63	0.775	61 5	4 4.3	209 42	13 58.8	1.0204	1.3008	4.30	0.6332
19	0.3827	11.83	0.788	60 46	4 3.1	208 47	13 55.1	1.0234	1.3013	4.18	0.6213
20	0.3855	12.03	0.802	60 24	4 1.6	207 52	13 51.5	1.0258	1.3018	4.07	0.6089
21	0.3882	12.23	0.815	59 59	3 59.9	206 57	13 47.8	1.0276	1.3024	3.94	0.5960
(16$^{\text{h}}$.0) 22	0.3909	+12.41	+0.827	59 35	3 58.3	206 2	13 44.1	+1.0286	+1.3029	−3.82	−0.5826
23	0.3937	12.55	0.837	59 14	3 56.9	205 7	13 40.5	1.0289	1.3033	3.70	0.5686
24	0.3964	12.66	0.844	58 56	3 55.7	204 13	13 36.9	1.0289	1.3038	3.58	0.5541
25	0.3992	12.73	0.849	58 44	3 54.9	203 18	13 33.2	1.0289	1.3043	3.46	0.5389
26	0.4019	12.78	0.852	58 37	3 54.5	202 24	13 29.6	1.0290	1.3047	3.34	0.5231
27	0.4046	+12.82	+0.854	58 34	3 54.3	201 30	13 26.0	+1.0297	+1.3052	−3.21	−0.5065
28	0.4074	12.87	0.858	58 33	3 54.2	200 36	13 22.4	1.0312	1.3056	3.08	0.4892
29	0.4101	12.95	0.863	58 30	3 54.0	199 42	13 18.8	1.0333	1.3060	2.96	0.4710
30	0.4129	13.07	0.871	58 24	3 53.6	198 48	13 15.2	1.0360	1.3064	2.83	0.4519
31	0.4156	13.23	0.882	58 13	3 52.9	197 54	13 11.6	1.0391	1.3067	2.70	0.4318
June 1	0.4183	+13.43	+0.895	57 57	3 51.8	197 1	13 8.1	+1.0423	+1.3071	−2.57	−0.4105
2	0.4211	13.65	0.910	57 35	3 50.3	196 7	13 4.5	1.0451	1.3075	2.44	0.3881
3	0.4238	13.89	0.926	57 9	3 48.6	195 14	13 0.9	1.0475	1.3078	2.31	0.3644
4	0.4265	14.12	0.941	56 42	3 46.8	194 21	12 57.4	1.0492	1.3081	2.18	0.3391
5	0.4293	14.32	0.955	56 14	3 44.9	193 27	12 53.8	1.0502	1.3084	2.05	0.3122
(17$^{\text{h}}$.0) 6	0.4320	+14.49	+0.966	55 50	3 43.3	192 34	12 50.3	+1.0507	+1.3087	−1.92	−0.2833
7	0.4348	14.62	0.975	55 29	3 41.9	191 41	12 46.7	1.0509	1.3089	1.79	0.2524
8	0.4375	14.72	0.981	55 14	3 40.9	190 48	12 43.2	1.0511	1.3091	1.66	0.2188
9	0.4402	14.80	0.987	55 4	3 40.3	189 55	12 39.7	1.0515	1.3094	1.52	0.1823
10	0.4430	14.87	0.991	54 58	3 39.9	189 2	12 36.1	1.0525	1.3096	1.40	0.1425
11	0.4457	+14.96	+0.997	54 53	3 39.5	188 9	12 32.6	+1.0541	+1.3098	−1.26	−0.0992
12	0.4484	15.07	1.005	54 48	3 39.2	187 17	12 29.1	1.0564	1.3099	1.12	0.0500
13	0.4512	15.21	1.014	54 40	3 38.7	186 24	12 25.6	1.0591	1.3101	0.99	9.9946
14	0.4539	15.39	1.026	54 28	3 37.9	185 31	12 22.1	1.0619	1.3102	0.85	9.9309
15	0.4567	15.60	1.040	54 10	3 36.7	184 39	12 18.6	1.0648	1.3103	0.72	9.8560
16	0.4594	+15.83	+1.055	53 49	3 35.3	183 46	12 15.1	+1.0672	+1.3104	−0.58	−9.7637
17	0.4621	16.05	1.070	53 24	3 33.6	182 54	12 11.6	1.0691	1.3105	0.45	9.6508
18	0.4649	16.25	1.083	52 59	3 31.9	182 1	12 8.1	1.0702	1.3105	0.31	9.4943
19	0.4676	16.42	1.094	52 35	3 30.3	181 8	12 4.5	1.0707	1.3106	0.18	9.2470
20	0.4703	16.56	1.104	52 14	3 28.9	180 16	12 1.1	1.0708	1.3106	−0.04	−8.6031
(18$^{\text{h}}$.0) 21	0.4731	+16.65	+1.110	51 57	3 27.8	179 23	11 57.5	+1.0706	+1.3106	+0.09	+8.9750
22	0.4758	16.72	1.115	51 45	3 27.0	178 31	11 54.1	1.0705	1.3106	0.23	9.3615
23	0.4786	16.77	1.118	51 38	3 26.5	177 38	11 50.5	1.0707	1.3105	0.37	9.5626
24	0.4813	16.83	1.122	51 34	3 26.3	176 46	11 47.1	1.0715	1.3105	0.50	9.6994
25	0.4840	16.91	1.127	51 30	3 26.0	175 53	11 43.5	1.0729	1.3104	0.64	9.8031
26	0.4868	+17.02	+1.135	51 24	3 25.6	175 1	11 40.1	+1.0749	+1.3103	+0.77	+9.8867
27	0.4895	17.18	1.145	51 15	3 25.0	174 8	11 36.5	1.0774	1.3102	0.91	9.9567
28	0.4922	17.37	1.158	51 1	3 24.1	173 16	11 33.1	1.0801	1.3100	1.04	0.0169
29	0.4950	17.59	1.173	50 42	3 22.8	172 23	11 29.5	1.0826	1.3099	1.17	0.0696
30	0.4977	17.83	1.189	50 18	3 21.2	171 30	11 26.0	1.0849	1.3097	1.31	0.1165
31	0.5005	+18.07	+1.205	49 52	3 19.5	170 38	11 22.5	+1.0866	+1.3095	+1.44	+0.1587
32	0.5032	+18.28	+1.219	49 25	3 17.7	169 45	11 19.0	+1.0877	+1.3093	+1.57	+0.1970

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
July 1	0.5005	+18.07	+1.205	49 52	3 19.5	170 38	11 22.5	+1.0866	+1.3095	+1.44	+0.1587
2	0.5032	18.28	1.219	49 25	3 17.7	169 45	11 19.0	1.0877	1.3093	1.57	0.1970
3	0.5059	18.47	1.231	48 59	3 15.9	168 52	11 15.5	1.0882	1.3091	1.71	0.2321
4	0.5087	18.61	1.241	48 36	3 14.4	167 59	11 11.9	1.0883	1.3088	1.84	0.2646
5	0.5114	18.72	1.248	48 18	3 13.2	167 6	11 8.4	1.0883	1.3086	1.97	0.2946
(19$^{\mathrm{h}}$.0) 6	0.5142	+18.80	+1.253	48 5	3 12.3	166 14	11 4.9	+1.0883	+1.3083	+2.10	+0.3226
7	0.5169	18.87	1.258	47 56	3 11.7	165 20	11 1.3	1.0887	1.3080	2.23	0.3487
8	0.5196	18.95	1.263	47 50	3 11.3	164 27	10 57.8	1.0896	1.3077	2.36	0.3733
9	0.5224	19.04	1.269	47 45	3 11.0	163 34	10 54.3	1.0909	1.3073	2 49	0.3964
10	0.5251	19.17	1.278	47 38	3 10.5	162 41	10 50.7	1.0929	1.3070	2.62	0.4183
11	0.5278	+19.33	+1.289	47 29	3 9.9	161 47	10 47.1	+1.0953	+1.3066	+2.75	+0.4392
12	0.5306	19.53	1.302	47 14	3 8.9	160 54	10 43.6	1.0977	1.3063	2.88	0.4588
13	0.5333	19.74	1.316	46 56	3 7.7	160 0	10 40.0	1.0999	1.3059	3.00	0.4774
14	0.5361	19.95	1.330	46 34	3 6.3	159 6	10 36.4	1.1016	1.3055	3.13	0.4951
15	0.5388	20.15	1.343	46 10	3 4.7	158 13	10 32.9	1.1028	1.3050	3.25	0.5122
16	0.5415	+20.32	+1.355	45 46	3 3.1	157 19	10 29.3	+1.1033	+1.3046	+3.38	+0.5284
17	0.5443	20.46	1.364	45 24	3 1.6	156 25	10 25.7	1.1033	1.3041	3.50	0.5438
18	0.5470	20.55	1.370	45 6	3 0.4	155 30	10 22.0	1.1029	1.3037	3.62	0.5587
19	0.5497	20.61	1.374	44 52	2 59.5	154 36	10 18.4	1.1024	1.3032	3.74	0.5730
20	0.5525	20.65	1.376	44 43	2 58.9	153 41	10 14.7	1.1021	1.3027	3.86	0.5867
21	0.5552	+20.68	+1.379	44 37	2 58.5	152 47	10 11.1	+1.1021	+1.3022	+3.98	+0.5998
(20$^{\mathrm{h}}$.0) 22	0.5580	20.73	1.382	44 34	2 58.3	151 52	10 7.5	1.1028	1.3017	4.10	0.6125
23	0.5607	20.81	1.387	44 30	2 58.0	150 57	10 3.8	1.1040	1.3012	4.21	0.6247
24	0.5634	20.93	1.395	44 24	2 57.6	150 2	10 0.1	1.1058	1.3006	4.33	0.6364
25	0.5662	21.09	1.406	44 14	2 56.9	149 7	9 56.5	1.1078	1.3001	4.44	0.6477
26	0.5689	+21.28	+1.419	44 0	2 56.0	148 12	9 52.8	+1.1100	+1.2995	+4.56	+0.6587
27	0.5716	21.50	1.433	43 41	2 54.7	147 17	9 49.1	1.1120	1.2990	4.67	0.6692
28	0.5744	21.71	1.447	43 18	2 53.2	146 21	9 45.4	1.1136	1.2984	4.78	0.6794
29	0.5771	21.91	1.461	42 54	2 51.6	145 25	9 41.7	1.1147	1.2978	4.89	0.6892
30	0.5799	22.08	1.472	42 29	2 49.9	144 29	9 37.9	1.1152	1.2972	5.00	0.6987
31	0.5826	+22.21	+1.481	42 7	2 48.5	143 33	9 34.2	+1.1152	+1.2966	+5.10	+0.7079
Aug. 1	0.5853	22.30	1.487	41 49	2 47.3	142 37	9 30.5	1.1149	1.2960	5.21	0.7168
2	0.5881	22.37	1.491	41 35	2 46.3	141 41	9 26.7	1.1146	1.2954	5.31	0.7253
3	0.5908	22.41	1.494	41 27	2 45.8	140 44	9 22.9	1.1145	1.2948	5.42	0.7336
4	0.5936	22.45	1.497	41 21	2 45.4	139 47	9 19.1	1.1147	1.2942	5.52	0.7416
5	0.5963	+22.51	+1.501	41 19	2 45.3	138 50	9 15.3	+1.1155	+1.2936	+5.62	+0.7494
(21$^{\mathrm{h}}$.0) 6	0.5990	22.60	1.507	41 15	2 45.0	137 53	9 11.5	1.1168	1.2929	5.71	0.7568
7	0.6018	22.72	1.515	41 9	2 44.6	136 56	9 7.7	1.1185	1.2923	5.81	0.7641
8	0.6045	22.88	1.525	41 0	2 44.0	135 59	9 3.9	1.1205	1.2917	5.90	0.7711
9	0.6072	23.05	1.537	40 47	2 43.1	135 1	9 0.1	1.1224	1.2911	6.00	0.7779
10	0.6100	+23.24	+1.549	40 30	2 42.0	134 3	8 56.2	+1.1240	+1.2904	+6.09	+0.7845
11	0.6127	23.41	1.561	40 10	2 40.7	133 5	8 52.3	1.1251	1.2898	6.18	0.7908
12	0.6155	23.56	1.571	39 49	2 39.3	132 6	8 48.4	1.1257	1.2892	6.26	0.7969
13	0.6182	23.68	1.578	39 29	2 37.9	131 8	8 44.5	1.1257	1.2885	6.35	0.8029
14	0.6209	23.75	1.583	39 12	2 36.8	130 9	8 40.6	1.1252	1.2879	6.44	0.8086
15	0.6237	+23.78	+1.585	38 58	2 35.9	129 10	8 36.7	+1.1245	+1.2873	+6.52	+0.8142
16	0.6264	+23.79	+1.586	38 50	2 35.3	128 11	8 32.7	+1.1238	+1.2867	+6.60	+0.8195

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	"	s	° '	h m	° '	h m			"	
Aug. 16	0.6264	+23.79	+1.586	38 50	2 35.3	128 11	8 32.7	+1.1238	+1.2867	+6.60	+0.8195
17	0.6291	23.79	1.586	38 45	2 35.0	127 12	8 28.8	1.1234	1.2861	6.68	0.8247
18	0.6319	23.80	1.587	38 44	2 34.9	126 13	8 24.9	1.1234	1.2855	6.76	0.8297
19	0.6346	23.84	1.589	38 44	2 34.9	125 13	8 20.9	1.1240	1.2849	6.83	0.8345
20	0.6374	23.91	1.594	38 43	2 34.9	124 13	8 16.9	1.1253	1.2843	6.90	0.8391
21	0.6401	+24.03	+1.602	38 39	2 34.6	123 13	8 12.9	+1.1269	+1.2837	+6.98	+0.8436
(22ʰ.0) 22	0.6428	24.18	1.612	38 31	2 34.1	122 13	8 8.9	1.1288	1.2831	7.05	0.8479
23	0.6456	24.35	1.623	38 18	2 33.2	121 13	8 4.9	1.1306	1.2826	7.11	0.8521
24	0.6483	24.53	1.635	38 1	2 32.1	120 12	8 0.8	1.1322	1.2820	7.18	0.8561
25	0.6510	24.70	1.647	37 42	2 30.8	119 12	7 56.8	1.1333	1.2815	7.24	0.8599
26	0.6538	+24.85	+1.657	37 21	2 29.4	118 11	7 52.7	+1.1339	+1.2809	+7.30	+0.8636
27	0.6565	24.96	1.664	37 2	2 28.1	117 10	7 48.7	1.1340	1.2804	7.36	0.8671
28	0.6593	25.03	1.669	36 46	2 27.1	116 9	7 44.6	1.1337	1.2799	7.42	0.8704
29	0.6620	25.07	1.671	36 35	2 26.3	115 7	7 40.5	1.1333	1.2794	7.48	0.8737
30	0.6647	25.09	1.672	36 28	2 25.9	114 6	7 36.4	1.1329	1.2789	7.53	0.8768
31	0.6675	+25.10	+1.673	36 25	2 25.7	113 4	7 32.3	+1.1328	+1.2785	+7.58	+0.8797
Sept. 1	0.6702	25.12	1.675	36 25	2 25.7	112 2	7 28.1	1.1332	1.2780	7.63	0.8825
2	0.6730	25.16	1.677	36 26	2 25.7	111 1	7 24.1	1.1341	1.2776	7.68	0.8851
3	0.6757	25.25	1.683	36 26	2 25.7	109 58	7 19.9	1.1355	1.2772	7.72	0.8877
4	0.6784	25.36	1.691	36 23	2 25.5	108 55	7 15.7	1.1371	1.2768	7.77	0.8901
(23ʰ.0) 5	0.6812	+25.50	+1.700	36 16	2 25.1	107 53	7 11.5	+1.1390	+1.2764	+7.80	+0.8923
6	0.6839	25.66	1.711	36 5	2 24.3	106 50	7 7.3	1.1407	1.2760	7.84	0.8944
7	0.6866	25.81	1.721	35 51	2 23.4	105 48	7 3.2	1.1419	1.2757	7.88	0.8964
8	0.6894	25.94	1.729	35 35	2 22.3	104 45	6 59.0	1.1427	1.2754	7.91	0.8982
9	0.6921	26.04	1.736	35 19	2 21.3	103 42	6 54.8	1.1429	1.2751	7.94	0.9000
10	0.6949	+26.10	+1.740	35 5	2 20.3	102 39	6 50.6	+1.1427	+1.2748	+7.97	+0.9015
11	0.6976	26.12	1.741	34 55	2 19.7	101 35	6 46.3	1.1421	1.2744	8.00	0.9030
12	0.7003	26.11	1.741	34 49	2 19.3	100 32	6 42.1	1.1414	1.2743	8.02	0.9043
13	0.7031	26.09	1.739	34 47	2 19.1	99 29	6 37.9	1.1408	1.2741	8.04	0.9055
14	0.7058	26.07	1.738	34 48	2 19.2	98 25	6 33.7	1.1407	1.2739	8.06	0.9066
15	0.7085	+26.07	+1.738	34 52	2 19.5	97 21	6 29.4	+1.1411	+1.2737	+8.08	+0.9076
16	0.7113	26.11	1.741	34 56	2 19.7	96 18	6 25.2	1.1420	1.2735	8.10	0.9083
17	0.7140	26.19	1.746	34 58	2 19.9	95 14	6 20.9	1.1435	1.2734	8.11	0.9090
18	0.7168	26.31	1.754	34 57	2 19.8	94 10	6 16.7	1.1453	1.2733	8.12	0.9096
19	0.7195	26.46	1.764	34 51	2 19.4	93 6	6 12.4	1.1472	1.2732	8.13	0.9100
(0ʰ.0) 20	0.7222	+26.62	+1.775	34 40	2 18.7	92 2	6 8.1	+1.1490	+1.2732	+8.13	+0.9103
21	0.7250	26.78	1.785	34 27	2 17.8	90 58	6 3.9	1.1504	1.2731	8.13	0.9105
22	0.7277	26.92	1.794	34 12	2 16.8	89 54	5 59.6	1.1514	1.2731	8.13	0.9106
23	0.7304	27.02	1.801	33 57	2 15.8	88 50	5 55.3	1.1518	1.2731	8.13	0.9105
24	0.7332	27.09	1.806	33 44	2 14.9	87 46	5 51.1	1.1519	1.2732	8.13	0.9102
25	0.7359	+27.13	+1.809	33 35	2 14.3	86 42	5 46.8	+1.1517	+1.2732	+8.13	+0.9099
26	0.7387	27.14	1.809	33 31	2 14.1	85 37	5 42.5	1.1515	1.2733	8.12	0.9095
27	0.7414	27.14	1.809	33 31	2 14.1	84 33	5 38.2	1.1515	1.2734	8.11	0.9089
28	0.7441	27.15	1.810	33 34	2 14.3	83 29	5 33.9	1.1519	1.2736	8.10	0.9082
29	0.7469	27.18	1.812	33 39	2 14.6	82 25	5 29.7	1.1528	1.2737	8.08	0.9073
30	0.7497	+27.24	+1.816	33 43	2 14.9	81 21	5 25.4	+1.1542	+1.2739	+8.06	+0.9064
31	0.7524	+27.34	+1.823	33 46	2 15.1	80 17	5 21.1	+1.1560	+1.2741	+8.04	+0.9053

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f		G		H		Log g.	Log h.	i	Log i.
			In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	″	s	° ′	h m	° ′	h m			″	
Oct.	1	0.7524	+27.34	+1.823	33 46	2 15.1	80 17	5 21.1	+1.1560	+1.2741	+8.04	+0.9053
	2	0.7551	27.47	1.831	33 45	2 15.0	79 13	5 16.9	1.1579	1.2743	8.02	0.9040
	3	0.7578	27.62	1.841	33 40	2 14.7	78 9	5 12.6	1.1599	1.2746	7.99	0.9027
	4	0.7606	27.78	1.852	33 31	2 14.1	77 4	5 8.3	1.1616	1.2749	7.96	0.9011
	5	0.7633	27.92	1.861	33 20	2 13.3	76 0	5 4.0	1.1628	1.2752	7.93	0.8995
$(1^{h}.0)$	6	0.7660	+28.03	+1.869	33 8	2 12.5	74 56	4 59.7	+1.1636	+1.2755	+7.90	+0.8977
	7	0.7688	28.10	1.873	32 57	2 11.8	73 53	4 55.5	1.1638	1.2758	7.87	0.8958
	8	0.7715	28.14	1.876	32 49	2 11.3	72 49	4 51.3	1.1637	1.2762	7.83	0.8937
	9	0.7743	28.14	1.876	32 44	2 10.9	71 45	4 47.0	1.1634	1.2765	7.79	0.8915
	10	0.7770	28.13	1.875	32 44	2 10.9	70 41	4 42.7	1.1632	1.2769	7.75	0.8892
	11	0.7797	+28.11	+1.874	32 48	2 11.2	69 38	4 38.5	+1.1632	+1.2773	+7.70	+0.8867
	12	0.7825	28.11	1.874	32 54	2 11.6	68 34	4 34.3	1.1637	1.2778	7.66	0.8841
	13	0.7852	28.15	1.877	33 1	2 12.1	67 31	4 30.1	1.1648	1.2782	7.61	0.8813
	14	0.7879	28.22	1.881	33 6	2 12.4	66 28	4 25.9	1.1664	1.2787	7.56	0.8784
	15	0.7907	28.34	1.889	33 9	2 12.6	65 24	4 21.6	1.1685	1.2792	7.50	0.8753
	16	0.7934	+28.49	+1.899	33 8	2 12.5	64 21	4 17.4	+1.1707	+1.2797	+7.45	+0.8721
	17	0.7962	28.66	1.911	33 2	2 12.1	63 18	4 13.2	1.1728	1.2802	7.39	0.8686
	18	0.7989	28.84	1.923	32 53	2 11.5	62 16	4 9.1	1.1748	1.2807	7.33	0.8651
	19	0.8016	29.01	1.934	32 41	2 10.7	61 13	4 4.9	1.1763	1.2813	7.27	0.8614
	20	0.8044	29.14	1.943	32 29	2 9.9	60 10	4 0.7	1.1773	1.2818	7.20	0.8575
$(2^{h}.0)$	21	0.8071	+29.24	+1.949	32 18	2 9.2	59 8	3 56.5	+1.1780	+1.2824	+7.13	+0.8534
	22	0.8098	29.31	1.954	32 10	2 8.7	58 5	3 52.3	1.1783	1.2829	7.07	0.8492
	23	0.8126	29.34	1.956	32 7	2 8.5	57 3	3 48.2	1.1785	1.2835	6.99	0.8448
	24	0.8153	29.37	1.958	32 7	2 8.5	56 1	3 44.1	1.1789	1.2842	6.92	0.8402
	25	0.8181	29.39	1.959	32 10	2 8.7	54 59	3 39.9	1.1796	1.2848	6.85	0.8354
	26	0.8208	+29.44	+1.963	32 16	2 9.1	53 57	3 35.8	+1.1807	+1.2854	+6.77	+0.8305
	27	0.8235	29.52	1.968	32 22	2 9.5	52 55	3 31.7	1.1824	1.2860	6.69	0.8253
	28	0.8263	29.63	1.975	32 26	2 9.7	51 54	3 27.6	1.1844	1.2866	6.61	0.8200
	29	0.8290	29.78	1.985	32 28	2 9.9	50 53	3 23.5	1.1867	1.2873	6.52	0.8144
	30	0.8318	29.96	1.997	32 25	2 9.7	49 51	3 19.4	1.1890	1.2879	6.44	0.8087
	31	0.8345	+30.14	+2.009	32 19	2 9.3	48 50	3 15.3	+1.1912	+1.2886	+6.35	+0.8027
Nov.	1	0.8372	30.32	2.021	32 10	2 8.7	47 49	3 11.3	1.1930	1.2892	6.26	0.7963
	2	0.8400	30.47	2.032	31 59	2 7.9	46 49	3 7.3	1.1944	1.2899	6.17	0.7901
	3	0.8427	30.59	2.039	31 49	2 7.3	45 48	3 3.2	1.1953	1.2905	6.07	0.7834
	4	0.8454	30.67	2.045	31 40	2 6.7	44 47	2 59.1	1.1957	1.2912	5.98	0.7765
$(3^{h}.0)$	5	0.8482	+30.72	+2.048	31 35	2 6.3	43 47	2 55.1	+1.1960	+1.2918	+5.88	+0.7693
	6	0.8509	30.74	2.049	31 34	2 6.3	42 47	2 51.1	1.1962	1.2925	5.78	0.7619
	7	0.8537	30.76	2.050	31 36	2 6.4	41 47	2 47.1	1.1966	1.2932	5.68	0.7542
	8	0.8564	30.78	2.052	31 41	2 6.7	40 47	2 43.1	1.1973	1.2938	5.58	0.7463
	9	0.8591	30.84	2.056	31 47	2 7.1	39 47	2 39.1	1.1986	1.2945	5.47	0.7380
	10	0.8619	+30.94	+2.062	31 52	2 7.5	38 48	2 35.2	+1.2004	+1.2951	+5.36	+0.7295
	11	0.8646	31.08	2.072	31 55	2 7.7	37 48	2 31.2	1.2026	1.2958	5.26	0.7206
	12	0.8673	31.26	2.084	31 55	2 7.7	36 49	2 27.3	1.2050	1.2964	5.15	0.7114
	13	0.8701	31.46	2.097	31 50	2 7.3	35 50	2 23.3	1.2075	1.2970	5.03	0.7019
	14	0.8728	31.67	2.111	31 42	2 6.8	34 51	2 19.4	1.2098	1.2976	4.92	0.6919
	15	0.8756	+31.88	+2.125	31 31	2 6.1	33 52	2 15.5	+1.2118	+1.2983	+4.81	+0.6817
	16	0.8783	+32.07	+2.138	31 18	2 5.2	32 53	2 11.5	+1.2133	+1.2989	+4.69	+0.6710

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
Nov. 16	0.8783	+32.07	+2.138	31 18	2 5.2	32 53	2 11.5	+1.2133	+1.2989	+4.69	+0.6710
17	0.8810	32.22	2.148	31 7	2 4.5	31 55	2 7.7	1.2145	1.2995	4.57	0.6600
18	0.8838	32.33	2.155	30 57	2 3.8	30 56	2 3.7	1.2153	1.3001	4.45	0.6485
19	0.8865	32.42	2.161	30 51	2 3.4	29 58	1 59.9	1.2159	1.3006	4.33	0.6365
$(4^{h}.0)$ 20	0.8892	32.48	2.165	30 48	2 3.2	29 0	1 56.0	1.2166	1.3013	4.21	0.6241
21	0.8920	+32.55	+2.170	30 49	2 3.3	28 2	1 52.1	+1.2175	+1.3018	+4.08	+0.6111
22	0.8947	32.62	2.175	30 51	2 3.4	27 4	1 48.3	1.2188	1.3023	3.96	0.5976
23	0.8975	32.73	2.182	30 55	2 3.7	26 6	1 44.4	1.2204	1.3028	3.83	0.5836
24	0.9002	32.87	2.191	30 58	2 3.9	25 9	1 40.6	1.2225	1.3033	3.71	0.5689
25	0.9029	33.05	2.203	30 58	2 3.9	24 11	1 36.7	1.2249	1.3038	3.58	0.5536
26	0.9057	+33.26	+2.217	30 55	2 3.7	23 14	1 32.9	+1.2274	+1.3043	+3.45	+0.5376
27	0.9084	33.48	2.232	30 48	2 3.2	22 16	1 29.1	1.2298	1.3048	3.32	0.5207
28	0.9111	33 70	2.247	30 39	2 2.6	21 19	1 25.3	1 2319	1.3053	3.19	0.5031
29	0.9139	33.90	2.260	30 27	2 1.8	20 22	1 21.5	1.2336	1.3057	3.05	0.4846
30	0.9166	34.07	2.271	30 15	2 1.0	19 25	1 17.7	1.2349	1.3061	2.92	0.4651
Dec. 1	0.9194	+34.20	+2.280	30 4	2 0.3	18 28	1 13.9	+1.2357	+1.3065	+2.78	+0.4445
2	0.9221	34.29	2.286	29 55	1 59.7	17 31	1 10.1	1.2362	1.3069	2.65	0.4230
3	0.9248	34.36	2.290	29 50	1 59.3	16 34	1 6.3	1.2367	1.3073	2.51	0.4002
4	0.9276	34.41	2.294	29 48	1 59.2	15 38	1 2.5	1.2371	1.3076	2.37	0.3754
5	0.9303	34.47	2.298	29 49	1 59.3	14 41	0 58.7	1.2379	1.3080	2.24	0.3494
$(5^{h}.0)$ 6	0.9331	+34.55	+2.303	29 51	1 59.4	13 44	0 54.9	+1.2391	+1.3083	+2.10	+0.3214
7	0.9358	34.66	2.311	29 53	1 59.5	12 48	0 51.2	1.2407	1.3086	1.96	0.2914
8	0.9385	34.82	2.321	29 54	1 59.6	11 51	0 47.4	1.2428	1.3089	1.82	0.2591
9	0.9413	35.02	2.334	29 52	1 59.5	10 55	0 43.7	1.2451	1.3091	1.68	0.2252
10	0.9440	35.25	2.350	29 47	1 59.1	9 59	0 39.9	1.2475	1.3094	1.53	0.1856
11	0.9467	+35.49	+2.366	29 37	1 58.5	9 3	0 36.2	+1.2498	+1.3096	+1.39	+0.1434
12	0 9495	35.73	2.382	29 25	1 57.7	8 6	0 32.4	1.2519	1.3098	1.25	0.0964
13	0.9522	35.95	2.397	29 11	1 56.7	7 10	0 28.7	1.2536	1.3100	1.11	0.0436
14	0.9550	36.14	2.409	28 57	1 55.8	6 14	0 24.9	1.2549	1.3101	0.96	9.9832
15	0.9577	36.29	2.419	28 45	1 55.0	5 18	0 21.2	1.2558	1.3102	0.82	9.9129
16	0.9604	+36.41	+2.427	28 34	1 54.3	4 22	0 17.5	+1.2565	+1.3104	+0.67	+9.8289
17	0.9632	36.50	2.433	28 28	1 53.9	3 26	0 13.7	1.2572	1.3104	0.53	9.7244
18	0.9659	36.59	2.439	28 24	1 53.6	2 29	0 9.9	1.2579	1.3105	0.39	9.5865
19	0.9686	36.68	2.445	28 23	1 53.5	1 33	0 6.2	1.2590	1.3106	0.24	9.3797
20	0.9714	36.80	2.453	28 23	1 53.5	0 37	0 2.5	1.2604	1.3106	+0.09	+8.9657
$(6^{h}.0)$ 21	0.9741	+36.95	+2.463	28 23	1 53.5	359 41	23 58.7	+1.2621	+1.3106	−0.05	−8.6794
22	0.9769	37.14	2.476	28 22	1 53.5	358 45	23 55.0	1.2642	1.3106	0.19	9.2851
23	0.9796	37.34	2.489	28 17	1 53.1	357 49	23 51.3	1.2664	1.3105	0.34	9.5281
24	0.9823	37.59	2.506	28 9	1 52.6	356 53	23 47.5	1.2686	1.3105	0.48	9.6830
25	0.9851	37.83	2.522	27 59	1 51.9	355 57	23 43.8	1.2707	1.3104	0.63	9.7969
26	0.9878	+38.04	+2.536	27 45	1 51.0	355 1	23 40.1	+1.2724	+1.3103	−0.77	−9.8869
27	0.9905	38.24	2.549	27 32	1 50.1	354 5	23 36.3	1.2736	1.3102	0.91	9.9613
28	0.9933	38.39	2.559	27 18	1 49.2	353 9	23 32.5	1.2744	1.3100	1.06	0.0247
29	0.9960	38.51	2.567	27 6	1 48.4	352 12	23 28.8	1.2749	1.3099	1.20	0.0799
30	0.9988	38.58	2.572	26 57	1 47.8	351 16	23 25.1	1.2752	1.3097	1.35	0.1288
31	1.0015	+38.64	+2.576	26 51	1 47.4	350 19	23 21.3	+1.2755	+1.3095	−1.49	−0.1735
32	1.0042	+38.70	+2.580	26 49	1 47.3	349 23	23 17.5	+1.2760	+1.3092	−1.63	−0.2121

MEAN PLACES FOR 1886.0. (January $0^d.0$—$0^d.289$, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
α Andromedæ . . .	2.0	0 2 29.752	+ 3.0907	+ 28 27 39.54	+ 19.885
* β Cassiopeæ	2.0	0 3 5.903	3.1722	+ 58 31 14.41	19.852
* 22 Andromedæ . . .	5.3	0 4 23.872	3.1012	+ 45 26 15.55	20.036
4 Draconis (H.) . . S. P.	4.7	0 6 51.240	2.8902	+101 45 0.93	20.023
γ Pegasi (*Algenib*) . .	2.7	0 7 21.953	3.0833	+ 14 32 58.95	20.024
* σ Andromedæ . . .	4.3	0 12 22.429	+ 3.1222	+ 36 9 11.01	+ 19.984
* ι Ceti	3.3	0 13 37.017	3.0529	− 9 27 22.34	19.958
* 6 Ursæ Minoris . . S. P.	6.0	0 14 19.826	0.1205	+ 91 40 4.81	19.941
* 44 Piscium	6.0	0 19 33.517	3.0730	+ 1 18 29.82	19.954
β Hydri	3.0	0 19 44.613	3.2363	− 77 53 46.94	20.286
12 Ceti	6.0	0 24 13.244	+ 3.0610	− 4 35 14.22	+ 19.940
κ Draconis . . . S. P.	3.3	0 28 36.855	2.5937	+109 34 59.99	19.892
* π Andromedæ . . .	4.0	0 30 47.575	3.1898	+ 33 5 29.66	19.874
α Cassiopeæ (*var.*) . .	2.5	0 34 2.559	3.3718	+ 55 54 42.87	19.792
β Ceti	2.0	0 37 52.035	3.0145	− 18 36 45.33	19.805
21 Cassiopeæ	6.0	0 38 7.800	+ 3.8520	+ 74 21 53.05	+ 19.756
* ο Cassiopeæ	5.0	0 38 22.470	3.3178	+ 47 39 36.72	19.758
* δ Piscium	4.3	0 42 46.060	3.1071	+ 6 57 51.86	19.652
32^2 Camelop. (H.). . S. P.	4.7	0 48 17.899	0.3854	+ 95 58 2.85	19.597
* γ Cassiopeæ	2.0	0 49 49.968	3.5765	+ 60 5 56.70	19.568
* μ Andromedæ . . .	4.0	0 50 25.613	+ 3.3100	+ 37 52 51.02	+ 19.621
* 43 Cephei (H.) . . .	4.3	0 53 19.341	7.1881	+ 85 38 41.98	19.512
ε Piscium	4.0	0 57 1.603	3.1087	+ 7 16 34.05	19.459
β Andromedæ . . .	2.3	1 3 21.050	3.3433	+ 35 0 57.05	19.170
* κ Tucanæ	5.0	1 11 54.188	2.0585	− 69 28 53.84	19.174
* *f* Piscium	5.0	1 11 55.103	+ 3.0894	+ 3 0 49.59	+ 19.039
α Ursæ Minoris (*Polaris*)	2.0	1 16 59.218	22.6328	+ 88 42 2.76	18.932
θ^1 Ceti	3.0	1 18 19.501	2.9970	− 8 46 18.83	18.674
38 Cassiopeæ	6.3	1 22 45.426	4.3728	+ 69 40 38.56	18.684
η Piscium	3.7	1 25 23.015	3.2020	+ 14 45 28.13	18.671
* υ Andromedæ . . .	4.0	1 30 6.510	+ 3.5031	+ 40 50 5.97	+ 18.153
* π Piscium	5.7	1 31 3.323	3.1700	+ 11 33 29.25	18.533
α Eridani (*Achernar*) .	1.0	1 33 27.765	2.2328	− 57 48 58.25	18.362
* ν Piscium	4.7	1 35 29.940	3.1175	+ 4 54 37.28	18.336
ο Piscium	4.3	1 39 22.447	3.1619	+ 8 35 0.40	18.224
* ζ Ceti	3.0	1 45 50.000	+ 2.9617	− 10 53 58.25	+ 17.831
β Arietis	3.0	1 48 20.576	3.3029	+ 20 15 1.17	17.736
50 Cassiopeæ	4.0	1 53 42.808	5.0047	+ 71 52 8.30	17.659
* γ Andromedæ . . .	2.3	1 56 54.208	3.6591	+ 41 46 55.62	17.452
α Arietis	2.0	2 0 44.864	3.3703	+ 22 55 22.33	17.182
α Draconis . . . S. P.	3.3	2 1 18.235	+ 1.6236	+115 4 45.09	+ 17.303
* β Trianguli	3.0	2 2 45.714	3.5535	+ 34 26 51.02	17.214
ξ^1 Ceti	4.3	2 6 57.491	+ 3.1737	+ 8 18 41.12	17.039
* 4 Ursæ Minoris . . S. P.	5.0	2 9 18.322	− 0.3280	+101 55 0.32	16.908
* γ Trianguli	4.3	2 10 32.305	+ 3.5500	+ 33 19 9.80	16.855
* 67 Ceti	6.0	2 11 17.812	+ 2.9892	− 6 56 53.11	+ 16.741
ι Cassiopeæ	4.0	2 19 40.709	4.8577	+ 66 53 20.44	16.447
* δ Hydri	4.0	2 19 43.397	1.0537	− 69 10 41.76	16.454
ξ^2 Ceti	4.0	2 22 5.904	+ 3.1833	+ 7 56 54.54	16.305
5 Ursæ Minoris . . S. P.	4.7	2 27 46.567	− 0.1943	+103 47 50.11	+ 16.011

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars

MEAN PLACES FOR 1886.0. (January $0^{d}.0$—$0^{d}.289$, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
* δ Ceti	4.0	2 33 38.378	+ 3.0725	− 0 9 50.45	+ 15.707
* μ Hydri	6.0	2 34 6.297	− 1.4443	− 79 36 22.96	15.677
* θ Persei	4.0	2 36 24.992	+ 4.0680	+ 48 44 43.57	15.471
γ Ceti	3.3	2 37 23.614	+ 3.1029	+ 2 45 17.18	15.350
* σ Arietis	5.7	2 45 11.943	+ 3.3040	+ 14 36 41.72	15.020
* 47 Cephei (H.) . . .	6.0	2 50 57.967	+ 7.7022	+ 78 57 59.37	+ 14.721
β Ursæ Minoris . . S. P.	2.0	2 51 2.756	− 0.2345	+105 22 43.08	14.719
* ε Arietis	4.3	2 52 41.645	+ 3.4204	+ 20 53 1.47	14.618
α Ceti	2.3	2 56 19.218	+ 3.1300	+ 3 38 30.60	14.320
* β Persei (*Algol*) (*var.*)	2.7	3 0 45.162	+ 3.8824	+ 40 30 55.81	14.135
48 Cephei (H.) . . .	6.3	3 5 53.091	+ 7.3946	+ 77 18 51.01	+ 13.759
ζ Arietis	4.7	3 8 20.958	+ 3.4387	+ 20 37 16.35	13.570
α Persei	2.0	3 16 11.233	+ 4.2558	+ 49 27 15.92	13.110
* ι Hydri	5.0	3 18 49.073	− 1.6052	− 77 48 15.51	13.020
γ^2 Ursæ Minoris . . S. P.	3.0	3 20 54.950	− 0.1362	+107 45 37.30	12.811
* *f* Tauri	4.0	3 24 34.745	+ 3.3045	+ 12 32 42.94	+ 12.577
ε Eridani	3.0	3 27 33.566	+ 2.8235	− 9 50 40.59	12.405
δ Persei	3.3	3 34 48.653	+ 4.2486	+ 47 25 18.90	11.828
* γ Camelopardalis (H.).	4.3	3 38 20.177	+ 6.2329	+ 70 58 45.79	11.571
η Tauri	3.0	3 40 42.483	+ 3.5563	+ 23 45 6.14	11.395
ζ Persei	3.0	3 46 58.014	+ 3.7595	+ 31 32 38.47	+ 10.966
ζ Ursæ Minoris . . S. P.	4.3	3 48 8.959	− 2.2583	+101 51 19.10	10.912
* γ Hydri	3.3	3 49 0.748	− 1.0005	− 74 35 17.16	10.977
* ε Persei	3.3	3 50 12.254	+ 4.0089	+ 39 40 45.63	10.741
γ Eridani	3.0	3 52 42.676	+ 2.7984	− 13 50 0.75	10.458
* A^1 Tauri	4.7	3 57 57.378	+ 3.5394	+ 21 46 9.47	+ 10.099
* *c* Persei	4.0	4 0 23.223	+ 4.3359	+ 47 24 24.96	9.960
Groombr. 2320 . . S. P.	6.3	4 6 0.626	+ 0.1384	+111 53 21.87	9.499
* o^1 Eridani	4.3	4 6 18.045	+ 2.9265	− 7 8 8.49	9.630
γ Tauri	4.0	4 13 18.373	+ 3.4086	+ 15 21 5.22	8.974
* η Ursæ Minoris . . S. P.	5.0	4 20 50.745	− 1.8204	+103 58 56.40	+ 8.153
ε Tauri	3.7	4 21 57.599	+ 3.4970	+ 18 55 35.75	8.274
η Draconis . . . S. P.	2.7	4 22 27.031	+ 0.8057	+118 13 39.43	8.226
* *m* Persei	6.0	4 25 23.709	+ 4.2092	+ 42 49 8.76	8.025
* δ Mensæ	6.0	4 25 42.580	− 4.2334	− 80 28 47.36	8.024
A Draconis . . . S. P.	5.0	4 28 12.718	− 0.1363	+110 59 7.48	+ 7.798
α Tauri (*Aldebaran*) .	1.0	4 29 22.764	+ 3.4370	+ 16 16 44.93	7.532
* τ Tauri	4.3	4 35 24.177	+ 3.5949	+ 22 44 13.70	7.204
α Camelopardalis . .	4.7	4 42 43.120	+ 5.9227	+ 66 8 50.19	6.633
* *i* Tauri	5.3	4 44 42.324	+ 3.5050	+ 18 38 41.09	6.425
ι Aurigæ	3.0	4 49 34.213	+ 3.9001	+ 32 59 4.11	+ 6.045
* ζ Aurigæ	4.0	4 54 30.603	+ 4.1845	+ 40 54 29.52	5.647
ε Ursæ Minoris . . S. P.	4.3	4 57 40.955	− 6.3422	+ 97 46 36.24	5.388
11 Orionis	5.0	4 58 3.282	+ 3.4241	+ 15 14 39.46	5.316
* β Eridani	3.0	5 2 14.720	+ 2.9484	− 5 14 4.79	4.942
α Aurigæ (*Capella*) .	1.0	5 8 16.092	+ 4.4242	+ 45 52 50.53	+ 4.053
β Orionis (*Rigel*) . .	1.0	5 9 3.553	+ 2.8811	− 8 20 3.15	4.415
* τ Orionis	4.0	5 12 4.256	+ 2.9124	− 6 58 7.00	4.152
β Tauri	2.0	5 19 5.139	+ 3.7889	+ 28 30 36.00	3.381
Groombridge 966 . .	6.3	5 24 29.557	+ 7.9982	+ 74 57 57.35	+ 3.114

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MEAN PLACES FOR 1886.0. (January 0d.0—0d.289, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
* χ Aurigæ	5.0	5 25 18.558	+ 3.9047	+ 32 6 24.59	+ 3.044
* Groombridge 944	6.3	5 25 33.774	+18.6311	+ 85 8 10.71	3.014
δ Orionis (*var.*)	2.5	5 26 10.956	+ 3.0633	− 0 23 4.06	2.943
α Leporis	3.0	5 27 42.139	+ 2.6447	− 17 54 16.85	2.816
ε Orionis	2.0	5 30 25.724	+ 3.0422	− 1 16 32.29	2.581
α Columbæ	2.0	5 35 31.321	+ 2.1727	− 34 8 8.01	+ 2.093
ω Draconis S. P.	5.0	5 37 37.218	− 0.3542	+111 11 22.17	1.631
* κ Orionis	2.7	5 42 20.961	+ 2.8448	− 9 42 39.61	1.546
* ν Aurigæ	4.0	5 43 35.302	+ 4.1541	+ 39 6 49.64	1.471
ψ^1 Draconis S. P.	4.3	5 43 57.995	− 1.0798	+107 47 44.08	1.675
* δ Doradus	4.3	5 44 34.335	+ 0.1045	− 65 46 41.53	+ 1.329
α Orionis (*var.*)	1.2	5 48 59.997	+ 3.2469	+ 7 23 5.29	0.969
* β Aurigæ	2.0	5 51 10.004	+ 4.4015	+ 44 56 3.98	0.762
* θ Aurigæ	3.0	5 51 56.888	+ 4.0919	+ 37 12 12.23	+ 0.616
ν Orionis	4.7	6 1 3.834	+ 3.4273	+ 14 46 51.68	− 0.124
22 Camelopardalis (H.)	4.7	6 6 16.733	+ 6.6177	+ 69 21 28.32	− 0.667
* η Geminorum	3.3	6 7 59.808	+ 3.6227	+ 22 32 19.65	0.716
δ Ursæ Minoris S. P.	4.3	6 9 5.488	−19.4565	+ 93 23 21.40	0.846
μ Geminorum	3.0	6 16 3.848	+ 3.6315	+ 22 34 15.45	1.526
* ψ^1 Aurigæ	5.3	6 16 7.110	+ 4.6266	+ 49 20 40.85	1.419
α Argus (*Canopus*)	1.0	6 21 25.365	+ 1.3304	− 52 38 1.21	− 1.863
* ν Geminorum	4.7	6 22 11.638	+ 3.5630	+ 20 16 59.52	1.961
* χ Draconis S. P.	4.0	6 23 6.653	− 1.0793	+107 19 1.09	1.642
γ Geminorum	2.3	6 31 7.572	+ 3.4674	+ 16 29 44.00	2.763
* ε Geminorum	3.3	6 36 55.073	+ 3.6935	+ 25 14 34.54	3.230
* ψ^5 Aurigæ	5.7	6 38 31.260	+ 4.3293	+ 43 41 22.62	− 3.207
† α Canis Majoris (*Sirius*)	1.0	6 40 7.484	+ 2.6437	− 16 33 37.89	4.700
* θ Geminorum	3.3	6 45 16.529	+ 3.9608	+ 34 5 51.47	3.968
51 Cephei (H.)	5.3	6 46 45.673	+29.9875	+ 87 13 21.24	4.156
* ζ Mensæ	5.8	6 49 31.089	− 4.8965	− 80 41 30.43	4.218
50 Draconis S. P.	6.0	6 50 2.686	− 1.9061	+104 42 3.56	− 4.419
ε Canis Majoris	1.7	6 54 8.758	+ 2.3577	− 28 49 3.70	4.706
* ζ Geminorum (*var.*)	4.0	6 57 20.872	+ 3.5626	+ 20 44 11.19	4.984
δ Canis Majoris	2.0	7 3 45.362	+ 2.4384	− 26 12 46.07	5.497
* 63 Aurigæ	5.0	7 3 48.816	+ 4.1370	+ 39 30 19.65	5.493
* 25 Camelopardalis	4.7	7 7 2.787	+12.9750	+ 82 37 39.84	− 5.814
* γ^2 Volantis (*var.*)	4.7	7 9 42.860	− 0.4860	− 70 18 47.93	5.886
δ Draconis S. P.	3.0	7 12 31.620	+ 0.0303	+112 32 20.36	6.326
δ Geminorum	3.3	7 13 18.868	+ 3.5882	+ 22 11 28.35	6.322
τ Draconis S. P.	4.7	7 17 44.486	− 1.1150	+106 51 23.25	6.781
Piazzi vii. 67	6.0	7 19 0.789	+ 6.3015	+ 68 41 48.66	− 6.815
* β Canis Minoris	3.0	7 20 58.115	+ 3.2598	+ 8 31 5.02	6.976
α^2 Geminorum (*Castor*)	1.7	7 27 19.578	+ 3.8389	+ 32 8 15.33	7.535
† α Canis Min. (*Procyon*)	1.0	7 33 20.048	+ 3.1436	+ 5 30 58.71	8 979
λ Ursæ Minoris S. P.	6.3	7 37 52.555	−63.9005	+ 91 2 32.02	8.317
β Geminorum (*Pollux*)	1.3	7 38 20.379	+ 3.6798	+ 28 18 2.09	− 8.400
* 26 Lyncis	6.0	7 46 24.545	+ 4.3892	+ 47 51 32.03	9.000
φ Geminorum	5.0	7 46 31.204	+ 3 6804	+ 27 3 35.88	9.013
* Groombridge 1374	5.7	7 46 31.842	+ 7.2922	+ 74 13 13.94	9.023
ε Draconis S. P.	3.7	7 48 33.169	− 0.1777	+110 1 20.68	− 9.174

*** Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.**

† Periodic corrections given in the Appendix are still to be applied to the positions of Sirius and Procyon.

MEAN PLACES FOR 1886.0. (January $0^{d}.0$—$0^{d}.289$, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
* ω^1 Cancri	6.0	7 54 2.000	+ 3.6377	+ 25 42 14.83	− 9.563
3 Ursæ Majoris (H.) .	5.7	8 1 27.629	6.0531	+ 68 48 29.17	10.135
15 Argus (ι)	3.0	8 2 41.352	2.5544	− 23 58 34.55	10.184
* ζ^1 Cancri	4.7	8 5 40.412	3.4468	+ 17 59 24.52	10.589
* β Cancri	3.7	8 10 19.946	+ 3.2588	+ 9 32 9.47	10.643
κ Cephei (*pr.*) . . S. P.	4.3	8 12 42.641	− 1.9174	+102 37 56.40	− 11.002
* 30 Monocerotis . . .	3.7	8 19 57.822	+ 3.0001	− 3 32 6.72	11.494
* θ Chamæleontis . . .	4.7	8 24 2.451	− 1.7048	− 77 6 58.44	11.767
η Cancri	5.7	8 26 6.980	+ 3.4788	+ 20 49 39.46	11.990
Groombr. 3241 . S. P.	6.3	8 30 29.537	− 0.2176	+107 51 16.54	12.222
* σ Hydræ	5.0	8 32 48.003	+ 3.1461	+ 3 44 27.31	− 12.421
* γ Cancri	4.3	8 36 41.308	3.4809	+ 21 53 39.56	12.711
ε Hydræ	3.3	8 40 44.341	3.1820	+ 6 50 10.88	12.993
* σ^2 Cancri (*mean*) . . .	5.7	8 47 17.285	3.6742	+ 31 0 37.31	13 393
ι Ursæ Majoris . . .	3.0	8 51 23.931	+ 4.1348	+ 48 29 18.34	13.890
12 Year Cat. 1879 . S. P.	6.0	8 52 43.829	− 2.5383	+ 99 52 32.90	− 13.692
σ^3 Ursæ Majoris . . .	5.0	9 0 21.086	+ 5.3594	+ 67 35 46.83	14.257
κ Cancri	5.0	9 1 34.366	3.2562	+ 11 7 35.03	14.280
* θ Hydræ	4.0	9 8 26.004	3.1263	+ 2 47 40.46	15.007
* β Argus	1.5	9 11 56.700	0.6789	− 69 14 51.61	14.804
ι Argus	2.0	9 14 2.170	+ 1.6012	− 58 47 48.61	− 14.992
* α Lyncis	3.3	9 14 6.471	3.6700	+ 34 52 25.56	15.015
α Cephei . . . . S. P.	2.7	9 15 51.510	1.4368	+117 53 50.23	15.168
1 Draconis (H.) . . .	4.3	9 20 45.725	9.0261	+ 81 49 43.69	15.423
α Hydræ	2.0	9 21 59.128	2.9492	− 8 9 54.01	15.443
d Ursæ Majoris . . .	4.7	9 24 23.110	+ 5.4066	+ 70 19 49.54	− 15.545
θ Ursæ Majoris . . .	3.0	9 25 13.630	4.0430	+ 52 11 46.18	16.207
β Cephei (*pr.*) . . S. P.	3.0	9 27 11.127	0.7953	+109 56 22.94	15.754
* 10 Leonis Minoris . .	4.7	9 27 14.293	3.6951	+ 36 54 11.15	15.771
* ο Leonis	3.7	9 35 3.954	+ 3.2073	+ 10 24 37.47	16.213
* ζ Chamæleontis . . .	5.0	9 37 12.608	− 1.5524	− 80 25 43.83	− 16.292
ε Leonis	3.0	9 39 22.770	+ 3.4157	+ 24 17 54.99	16.417
11 Cephei . . . . S. P.	5.0	9 40 15.026	0.9024	+109 12 48.10	16.536
μ Leonis	4.0	9 46 16.751	3.4227	+ 26 32 36.11	16.788
* 19 Leonis Minoris . .	5.3	9 50 42.021	3.6966	+ 41 35 52.70	16.953
79 Draconis . . . S. P.	6.3	9 51 26.717	+ 0.7308	+106 50 12.99	− 17.012
* π Leonis	5.0	9 54 11.331	3.1746	+ 8 35 26.48	17.132
α Leonis (*Regulus*) .	1.3	10 2 18.026	3.2010	+ 12 31 26.25	17.467
32 Ursæ Majoris . . .	6.0	10 9 44.757	4.4247	+ 65 40 34.95	17.803
* λ Ursæ Majoris . . .	3.3	10 10 13.122	3.6409	+ 43 28 58.64	17.865
γ^1 Leonis	2.0	10 13 41.210	+ 3.3154	+ 20 25 4.10	− 18.080
* μ Hydræ	4.0	10 20 34.668	2.9005	− 16 15 17.76	18.305
* β Leonis Minoris . .	4.3	10 21 17.372	3.4876	+ 37 17 27.64	18.308
* α Antliæ	4.0	10 21 56.121	2.7388	− 30 29 16.95	18.212
9 Draconis (H.) . . .	4.7	10 25 23.198	5.2724	+ 76 17 58.68	18.384
ρ Leonis	4.0	10 26 48.527	+ 3.1644	+ 9 53 34.28	− 18.427
226 Cephei (B.) . . S. P.	5.3	10 30 16.224	1.0786	+104 21 39.75	18.527
* 41 Leonis Minoris . .	5.7	10 37 13.000	3.2713	+ 23 47 5.65	18.734
η Argus (*var.*) . . .	1–6	10 40 38 337	2.3127	− 59 5 7.23	18.867
l Leonis	5.3	10 43 15.910	+ 3.1588	+ 11 8 53.31	− 18.968

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1886.0. (January 0^d.0—0^d.289, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
* δ^2 Chamæleontis . . .	5.0	10 44 41.889	+ 0.6103	− 79 56 20.71	− 19.002
ι Cephei . . . . S. P.	3.3	10 45 37.315	2.1211	+114 23 56.85	18.874
* 46 Leonis Minoris . .	4.0	10 46 56.080	3.3705	+ 34 49 45.66	19.291
* Groombridge 1706 .	6.0	10 50 48.446	4.9807	+ 78 22 50.18	19.175
α Ursæ Majoris . . .	2.0	10 56 41.146	+ 3.7502	+ 62 21 58.44	19.359
* η Octantis	6.0	11 0 4.306	− 0.2852	− 83 58 50.85	− 19.409
* p^3 Leonis	6.0	11 1 5.320	+ 3.0621	+ 2 34 26.40	19.484
* ψ Ursæ Majoris . . .	3.3	11 3 15.096	3.3946	+ 45 6 59.63	19.501
δ Leonis	2.3	11 8 2.707	3.1987	+ 21 8 53.15	19.683
* ν Ursæ Majoris . . .	3.3	11 12 19.322	3.2584	+ 33 42 58.37	19.570
δ Crateris	3.3	11 13 38.509	+ 2.9961	− 14 9 42.75	− 19.461
ο Cephei . . . . S. P.	5.3	11 13 56.893	2.4426	+112 30 43.44	19.667
τ Leonis	5.0	11 22 4.470	3.0862	+ 3 29 2.18	19.801
λ Draconis	3.3	11 24 37.506	3.6252	+ 69 57 36.49	19.836
* ξ Hydræ	4.0	11 27 23.711	2.9424	− 31 13 17.41	19.884
υ Leonis	5.0	11 31 6.717	+ 3.0712	− 0 11 40.15	− 19.859
γ Cephei . . . . S. P.	3.3	11 34 40.308	2.4128	+103 0 14.33	20.075
* χ Ursæ Majoris . . .	3.7	11 40 1.713	3.1917	+ 48 24 41.10	19.961
β Leonis	2.0	11 43 14.674	3.0642	+ 15 12 33.32	20.119
γ Ursæ Majoris . . .	2.3	11 47 49.934	3.1833	+ 54 19 42.57	20.027
Groombr. 4163 . S. P.	7.0	11 49 17.755	+ 2.8620	+106 13 26.72	− 20.022
* π Virginis	4.3	11 55 1.850	3.0752	+ 7 14 59.97	20.088
ο Virginis	4.0	11 59 24.109	3.0577	+ 9 21 58.19	20.015
* ε Corvi	3.0	12 4 15.835	3.0792	− 21 59 9.62	20.041
4 Draconis (H.) . . .	4.7	12 6 51.240	2.8902	+ 78 14 59.07	20.023
γ Corvi	2.0	12 9 56.649	+ 3.0792	− 16 54 32.13	− 20.018
* 2 Canum Venaticorum	5.3	12 10 24.735	3.0228	+ 41 17 41.72	20.066
β Chamæleontis . . .	5.0	12 11 40.690	3.3939	− 78 40 44.40	19.984
η Virginis	3.3	12 14 4.426	3.0685	− 0 1 59.74	20.043
* 6 Ursæ Minoris . . .	6.0	12 14 19.826	0.1205	+ 88 19 55.19	19.941
α^1 Crucis	1.0	12 20 15.016	+ 3.2752	− 62 28 1.97	− 20.016
* δ^2 Corvi	2.3	12 23 58.081	3.1021	− 15 52 49.67	20.087
* β Canum Venaticorum	4.3	12 28 19.677	2.8602	+ 41 58 37.13	19.618
β Corvi	2.3	12 28 23.982	3.1411	− 22 45 58.41	19.965
κ Draconis	3.3	12 28 36.855	2.5937	+ 70 25 0.01	19.892
* γ Virginis (*mean*) . .	2.7	12 35 53.058	+ 3.0382	− 0 49 27.14	− 19.815
21 Cassiopeæ . . . S. P.	6.0	12 38 7.800	3.8520	+105 38 6.95	19.756
* 31 Coronæ Borealis . .	5.0	12 46 8.804	2.9305	+ 28 9 39.93	19.664
32^2 Camelopardalis (H.).	4.7	12 48 17.899	0.3854	+ 84 1 57.15	19.597
* γ Cassiopeæ . . . S. P.	2.0	12 49 49.968	3.5765	+119 54 3.30	19.568
α Canum Venaticorum	2.7	12 50 41.698	+ 2.8160	+ 38 56 2.98	− 19.516
* 43 Cephei (H.) . . S. P.	4.3	12 53 19.341	7.1881	+ 94 21 18.02	19.512
* δ Muscæ	4.0	12 54 26.491	4.0289	− 70 56 0.21	19.481
* ε Virginis	2.7	12 56 30.151	2.9880	+ 11 34 19.29	19.421
θ Virginis	4.3	13 4 2.846	3.1009	− 4 55 48.66	19.317
* 20 Canum Venaticorum	4.7	13 12 25.811	+ 2.6972	+ 41 10 22.65	− 19.040
α Urs. Min. (*Polaris*) S. P.	2.0	13 16 59.218	22.6328	+ 91 17 57.24	18.932
α Virginis (*Spica*) . .	1.0	13 19 11.252	3.1533	− 10 33 57.75	18.906
* κ Octantis	5.0	13 22 39.982	8.6168	− 85 12 1.56	18.800
38 Cassiopeæ . . . S. P.	6.3	13 22 45.426	+ 4.3728	+110 19 21.44	− 18.684

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MEAN PLACES FOR 1886.0. (January $0^d.0$—$0^d.289$, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
ζ Virginis	3.3	13 28 53.063	+ 3.0529	— 0 0 45.83	— 18.524
* B. A. C. 4536 . . .	5.0	13 29 42.338	2.6826	+ 37 45 59.98	18.545
* m Virginis	6.0	13 35 37.745	3.1428	— 8 7 38.54	18.296
η Ursæ Majoris . . .	2.0	13 43 2.926	2.3716	+ 49 52 56.77	18.085
η Bootis	3.0	13 49 15.411	2.8568	+ 18 58 10.34	18.178
50 Cassiopeæ . . . S. P.	4.0	13 53 42.808	+ 5.0047	+108 7 51.70	— 17.659
* θ Apodis	5.0	13 54 15.155	5.6646	— 76 14 43.11	17.606
β Centauri	1.0	13 55 46.946	4.1748	— 59 49 20.93	17.601
* π Hydræ	3.7	13 59 52.950	3.4071	— 26 7 58.41	17.513
α Draconis	3.3	14 1 18.235	1.6236	+ 64 55 14.91	17.303
* d Bootis	5.0	14 5 12.018	+ 2.7388	+ 25 37 55.31	— 17.208
* κ Virginis	4.3	14 6 48.913	3.1934	— 9 44 33.70	16.938
* δ Octantis	5.0	14 8 45.494	+ 8.9426	— 83 8 38.20	16.979
* 4 Ursæ Minoris . . .	5.0	14 9 18.322	— 0.3280	+ 78 4 59.68	16.908
α Bootis (*Arcturus*) .	1.0	14 10 27.715	+ 2.7348	+ 19 46 34.65	18.891
* λ Bootis	4.0	14 12 2.977	+ 2.2829	+ 46 36 43.48	— 16.667
* λ Virginis	4.7	14 12 56.516	3.2374	— 12 50 45.19	16.739
ι Cassiopeæ . . . S. P.	4.0	14 19 40.709	4.8577	+113 6 39.56	16.447
θ Bootis	4.0	14 21 19.008	2.0442	+ 52 22 40.56	16.768
ρ Bootis	3.7	14 26 55.073	+ 2,5876	+ 30 52 19.83	15.969
5 Ursæ Minoris . . .	4.7	14 27 46.567	— 0.1943	+ 76 12 9.89	— 16.011
α^2 Centauri	1.0	14 31 52.865	+ 4.0435	— 60 22 1.09	15.388
* α Apodis	4.7	14 33 44.589	7.1677	— 78 33 32.64	15.721
* 33 Bootis	5.3	14 34 35.670	2.2344	+ 44 53 48.28	15.718
ε Bootis	2.3	14 40 0.557	2.6213	+ 27 33 18.82	15.351
α^2 Libræ	2.3	14 44 34.325	+ 3.3090	— 15 34 2.84	— 15.180
* 47 Cephei (H.) . . S. P.	6.0	14 50 57.967	+ 7.7022	+101 2 0.63	14.721
β Ursæ Minoris . . .	2.0	14 51 2.756	— 0.2345	+ 74 37 16.92	14.719
* γ Scorpii	3.3	14 57 23.984	+ 3.5013	— 24 49 59.24	14.369
β Bootis	3.0	14 57 39.137	2.2601	+ 40 50 26.06	14.370
48 Cephei (H.) . . S. P.	6.3	15 5 53.091	+ 7.3946	+102 41 8.99	— 13.759
β Libræ	2.0	15 10 52.367	3.2214	— 8 57 41.95	13.522
* δ Bootis	3.0	15 10 54.443	2.4209	+ 33 44 26.57	13.594
* ρ Octantis	6.0	15 17 9.042	12.9303	— 84 4 55.06	13.035
μ^1 Bootis	4.0	15 20 11.053	+ 2.2662	+ 37 46 38.88	12.769
γ^2 Ursæ Minoris . . .	3.0	15 20 54.950	— 0.1362	+ 72 14 22.70	— 12.811
* β Coronæ Borealis . .	4.0	15 23 7.757	+ 2.4750	+ 29 29 56.52	12.605
α Coronæ Borealis . .	2.0	15 29 51.698	2.5392	+ 27 5 55.89	12.317
* γ Camelop. (H.) . . S. P.	4.3	15 38 20.177	6.2329	+109 1 14.21	11.571
α Serpentis	2.3	15 38 39.180	2.9513	+ 6 47 5.45	11.565
ε Serpentis	3.3	15 45 8.021	+ 2.9869	+ 4 49 17.71	— 11.063
ζ Ursæ Minoris . . .	4.3	15 48 8.959	— 2.2583	+ 78 8 40.90	10.912
ε Coronæ Borealis . .	4.0	15 52 52.143	+ 2.4831	+ 27 12 30.70	10.623
δ Scorpii	2.3	15 53 35.609	3.5381	— 22 17 46.89	10.544
β^1 Scorpii	2.0	15 58 48.549	3.4803	— 19 29 33.33	10.155
* δ^1 Apodis	5.3	16 3 20.535	+ 8.7443	— 78 24 20.02	— 9.753
* φ Herculis	4.0	16 5 10.508	1.8812	+ 45 14 3.09	9.590
Groombridge 2320 .	6.3	16 6 0.626	0.1384	+ 68 6 38.13	9.499
δ Ophiuchi	3.0	16 8 22.305	3.1394	— 3 24 0.05	9.529
* σ Coronæ Borealis (*mean*)	5.7	16 10 24.514	+ 2.2446	+ 34 8 53.19	— 9.267

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MEAN PLACES FOR 1886.0. (January $0^d.0$—$0^d.289$, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
* γ Apodis	4.3	16 15 59.438	+ 8.9994	− 78 38 17.25	− 8.840
τ Herculis	3.3	16 16 18.884	+ 1.8009	+ 46 35 6.47	8.743
* η Ursæ Minoris . . .	5.0	16 20 50.745	− 1.8204	+ 76 1 3.60	8.153
α Scorpii (*Antares*) .	1.3	16 22 25.087	+ 3.6697	− 26 10 40.99	8.320
η Draconis	2.7	16 22 27.031	0.8057	+ 61 46 20.57	8.226
β Herculis	2.3	16 25 19.166	+ 2.5774	+ 21 44 19.24	− 8.070
A Draconis	5.0	16 28 12.718	− 0.1363	+ 69 0 52.52	7.798
ζ Ophiuchi	2.7	16 30 52.907	+ 3.2988	− 10 20 7.22	7.581
α Trianguli Australis .	2.0	16 36 36.134	6.2970	− 68 48 59.24	7.194
η Herculis	3.3	16 38 59.249	2.0537	+ 39 8 22.38	7.032
α Camelopardalis . S. P.	4.7	16 42 43.120	+ 5.9227	+113 51 9.81	− 6.633
κ Ophiuchi	3.3	16 52 16.355	2.8373	+ 9 33 10.91	5.846
d Herculis	5.0	16 57 23.839	+ 2.2112	+ 33 44 2.08	5.408
ε Ursæ Minoris . . .	4.3	16 57 40.955	− 6.3422	+ 82 13 23.76	5.388
* η Ophiuchi	2.7	17 3 50.398	+ 3.4367	− 15 34 58.15	4.756
α^1 Herculis (*var.*) . .	3.5	17 9 26.971	+ 2.7334	+ 14 31 15.56	− 4.361
* π Herculis	3.0	17 11 4.616	2.0890	+ 36 56 17.22	4.240
* θ Ophiuchi	3.3	17 15 0.504	3.6789	− 24 53 5.10	3.962
b Ophiuchi (*var.*) . .	5.0	17 19 24.506	3.6588	− 24 4 9.67	3.665
* δ Aræ	4.0	17 20 48.688	5.4006	− 60 35 14.26	3.553
Groombr. 966 . . S. P.	6.3	17 24 29.557	+ 7.9982	+105 2 2.65	− 3.114
* Groombr. 944 . . S. P.	6.3	17 25 33.774	18.6311	+ 94 51 49.29	3.014
β Draconis	2.7	17 27 51.458	1.3532	+ 52 23 9.61	2.804
α Ophiuchi	2.0	17 29 38.568	2.7828	+ 12 38 37.45	2.885
* ι Herculis	3.3	17 36 14.913	+ 1.6965	+ 46 4 2.47	2.076
ω Draconis	5.0	17 37 37.218	− 0.3542	+ 68 48 37.83	− 1.631
μ Herculis	3.3	17 41 59.853	+ 2.3462	+ 27 47 16.30	2.333
ψ^1 Draconis	4.3	17 43 57.995	− 1.0798	+ 72 12 15.92	1.675
* θ Herculis	4.0	17 52 20.589	+ 2.0551	+ 37 15 58.03	0.651
γ Draconis	2.3	17 53 57.548	1.3914	+ 51 30 9.18	0.558
γ^2 Sagittarii	3.3	17 58 29.081	+ 3.8514	− 30 25 27.74	− 0.351
* ο Herculis	4.0	18 3 5.749	2.3393	+ 28 44 50.46	+ 0.273
22 Camelop. (H.) . . S. P.	4.7	18 6 16.733	6.6177	+110 38 31.68	0.667
μ Sagittarii	4.0	18 6 56.751	+ 3.5866	− 21 5 15.37	0.595
δ Ursæ Minoris . . .	4.3	18 9 5.488	−19.4565	+ 86 36 38.60	0.846
η Serpentis	3.0	18 15 24.666	+ 3.1023	− 2 55 38.38	+ 0.673
* λ Sagittarii	3.0	18 20 56.108	+ 3.7026	− 25 29 1.30	1.619
* χ Draconis	4.0	18 23 6.653	− 1.0793	+ 72 40 58.91	1.642
1 Aquilæ	4.3	18 29 0.214	+ 3.2645	− 8 19 22.68	2.201
* ζ Pavonis	4.0	18 29 42.561	7.0306	− 71 31 23.27	2.451
α Lyræ (*Vega*) . . .	1.0	18 33 4.740	+ 2.0313	+ 38 40 40.71	+ 3.157
σ Octantis.	6.0	18 35 17.097	107.0240	− 89 16 14.60	3.055
β Lyræ (*var.*) . . .	4.0	18 45 52.280	2.2142	+ 33 13 50.68	3.970
51 Cephei (H.) . . S. P.	5.3	18 46 45.673	+29.9875	+ 92 46 38.76	4.156
σ Sagittarii	2.3	18 48 11.782	+ 3.7218	− 26 26 14.15	4.109
50 Draconis	6.0	18 50 2.686	− 1.9061	+ 75 17 56.44	+ 4.419
* γ Lyræ	3.3	18 54 40.768	+ 2.2443	+ 32 32 1.44	4.750
ζ Aquilæ	3.0	19 0 10.238	2.7560	+ 13 41 40.09	5.101
* ι Lyræ	5.0	19 3 14.061	2.1412	+ 35 55 19.05	5.472
* 25 Camelopardalis . S. P.	4.7	19 7 2.787	+12.9750	+ 97 22 20.16	+ 5.814

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1886.0. (January 0d.0—0d.289, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
d Sagittarii	5.0	19 10 57.876	+ 3.5125	− 19 9 17.37	+ 6.093
* θ Lyræ	4.3	19 12 24.633	2.0790	+ 37 55 51.77	6.232
δ Draconis	3.0	19 12 31.620	+ 0.0303	+ 67 27 39.64	6.326
τ Draconis	4.7	19 17 44.486	− 1.1150	+ 73 8 36.75	6.781
Piazzi vii. 67 . . S. P.	6.0	19 19 0.789	+ 6.3015	+111 18 11.34	6.815
δ Aquilæ	3.3	19 19 45.027	+ 3.0253	+ 2 53 17.61	+ 6.915
* β Cygni	3.0	19 26 7.446	2.4194	+ 27 43 14.75	7.352
κ Aquilæ	5.0	19 30 45.488	3.2290	− 7 16 48.24	7.736
* β Sagittæ	4.3	19 35 55.734	+ 2.6955	+ 17 12 44.58	8.122
λ Ursæ Minoris	6.3	19 37 52.555	−63.9005	+ 88 57 27.98	8.317
γ Aquilæ	3.0	19 40 50.400	+ 2.8522	+ 10 20 9.94	+ 8.533
* δ Cygni	2.7	19 41 24.745	1.8761	+ 44 51 10.21	8.623
α Aquilæ (*Altair*)	1.3	19 45 13.277	2.9277	+ 8 34 4.35	9.257
* Groombr. 1374 . S. P.	5.7	19 46 31.842	7.2922	+105 46 46.06	9.023
* ε Pavonis	4.0	19 47 24.025	+ 7.0542	− 73 12 32.86	8.950
ε Draconis	3.7	19 48 33.169	− 0.1777	+ 69 58 39.32	+ 9.174
β Aquilæ	4.0	19 49 42.813	+ 2.9471	+ 6 7 21.44	8.746
* γ Sagittæ	3.7	19 53 41.252	2.6678	+ 19 10 59.32	9.582
* *c* Sagittarii	5.0	19 55 38.783	3.6954	− 28 1 33.10	9.714
τ Aquilæ	6.0	19 58 34.298	2.9331	+ 6 57 24.53	9.926
3 Ursæ Majoris (H.) S.P.	5.7	20 1 27.629	+ 6.0531	+111 11 30.83	+ 10.135
* θ Aquilæ	3.0	20 5 25.332	3.0973	− 1 9 32.52	10.444
* o^1 Cygni	4.3	20 10 2.528	1.8893	+ 46 23 45.19	10.781
α^2 Capricorni	3.0	20 11 43.753	+ 3.3325	− 12 53 50.75	10.902
κ Cephei (*pr.*)	4.3	20 12 42.641	− 1.9174	+ 77 22 3.60	11.002
α Pavonis	2.0	20 16 37.840	+ 4.7861	− 57 5 56.62	+ 11.168
γ Cygni	2.3	20 18 8.323	2.1536	+ 39 53 31.64	11.361
π Capricorni	5.0	20 20 47.753	3.4400	− 18 35 4.94	11.542
ε Delphini	4.0	20 27 46.023	+ 2.8672	+ 10 54 59.30	12.030
Groombridge 3241	6.3	20 30 29.537	− 0.2176	+ 72 8 43.46	12.222
* α Delphini	3.7	20 34 20.575	+ 2.7878	+ 15 30 37.28	+ 12.510
* β Pavonis	3.0	20 34 40.549	5.4781	− 66 36 40.77	12.507
α Cygni	1.7	20 37 32.761	2.0443	+ 44 52 23.71	12.716
* ψ Capricorni	4.3	20 39 20.603	3.5591	− 25 40 47.48	12.675
* ε Cygni	2.7	20 41 35.928	2.4275	+ 33 32 36.71	13.330
μ Aquarii	4.7	20 46 30.295	+ 3.2401	− 9 24 37.80	+ 13.278
12 Year Cat. 1879	6.0	20 52 43.829	− 2.5383	+ 80 7 27.10	13.692
ν Cygni	4.0	20 52 55.398	+ 2.2340	+ 40 43 42.95	13.717
σ^2 Ursæ Majoris . . S. P.	5.0	21 0 21.086	5.3594	+112 24 13.17	14.257
61^1 Cygni	5.0	21 1 47.230	2.6831	+ 38 11 21.02	17.521
ζ Cygni	3.0	21 8 5.047	+ 2.5495	+ 29 45 34.71	+ 14.602
* τ Cygni	4.0	21 10 14.456	2.3933	+ 37 33 32.71	15.255
α Cephei	2.7	21 15 51.510	1.4368	+ 62 6 9.77	15.168
1 Pegasi	4.3	21 16 48.844	2.7721	+ 19 19 1.75	15.232
* ζ Capricorni	4.0	21 20 9.403	3.4332	− 22 54 16.17	15.390
1 Draconis (H.) . . S. P.	4.3	21 20 45.725	+ 9.0261	+ 98 10 16.31	+ 15.423
d Ursæ Majoris . . S. P.	4.7	21 24 23.110	5.4066	+109 40 10.46	15.545
β Aquarii	3.0	21 25 33.452	3.1620	− 6 4 20.06	15.653
β Cephei (*pr.*)	3.0	21 27 11.127	0.7953	+ 70 3 37.06	15.754
ξ Aquarii	5.0	21 31 41.000	+ 3.1982	− 8 21 53.96	+ 15.963

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1886.0. (January $0^d.0$—$0^d.289$, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
* 74 Cygni	5.0	21 32 22.805	+ 2.4012	+ 39 54 5.44	+ 16.045
* λ^1 Octantis.	5.3	21 33 19.053	9.8259	— 83 14 30.23	16.005
ε Pegasi	2.3	21 38 35.238	2.9467	+ 9 21 9.85	16.349
11 Cephei	5.0	21 40 15.026	0.9024	+ 70 47 11.90	16.536
* π^2 Cygni	4.3	21 42 34.928	2.2129	+ 48 46 56.58	16.538
μ Capricorni	5.0	21 47 4.823	+ 3.2764	— 14 5 16.69	+ 16.772
* 16 Pegasi	5.3	21 47 52.510	2.7276	+ 25 23 20.66	16.812
79 Draconis	6.3	21 51 26.717	0.7308	+ 73 9 47.01	17.012
α Aquarii	3.0	21 59 55.716	3.0829	— 0 52 23.97	17.350
α Gruis	2.0	22 1 2.664	3.8076	— 47 30 44.69	17.240
* π Pegasi	4.0	22 4 55.496	+ 2.6597	+ 32 37 9.03	+ 17.575
* υ Octantis	6.0	22 8 32.024	13.2968	— 86 32 43.64	17.855
32 Ursæ Majoris . . S. P.	6.0	22 9 44.757	4.4247	+114 19 25.05	17.803
θ Aquarii	4.3	22 10 49.074	3.1694	— 8 21 2.17	17.796
* γ Aquarii	3.3	22 15 46.058	3.1009	— 1 57 41.49	18.034
π Aquarii	4.7	22 19 27.319	+ 3.0648	+ 0 47 57.17	+ 18.150
* σ Aquarii	5.0	22 24 36.749	3.1761	— 11 15 39.57	18.313
9 Draconis (H.) . . S. P.	4.7	22 25 23.198	5.2724	+103 42 1.32	18.384
* α Lacertæ.	4.0	22 26 35.726	2.4616	+ 49 41 47.53	18.411
η Aquarii	4.0	22 29 29.897	3.0837	— 0 42 17.33	18.453
226 Cephei (B.) . . .	5.3	22 30 16.224	+ 1.0786	+ 75 38 20.25	+ 18.527
* 10 Lacertæ	5.0	22 34 8.790	2.6860	+ 38 27 25.58	18.665
* β Octantis.	4.7	22 34 20.509	6.5070	— 81 58 42.04	18.670
ζ Pegasi	3.3	22 35 46.603	2.9908	+ 10 14 11.40	18.701
* λ Pegasi	4.0	22 41 2.418	2.8849	+ 22 57 57.33	18.870
ι Cephei	3.3	22 45 37.315	+ 2.1211	+ 65 36 3.15	+ 18.874
λ Aquarii	4.0	22 46 40.039	3.1330	— 8 11 9.40	19.071
* Groombr. 1706 . S. P.	6.0	22 50 48.446	4.9807	+101 37 9.82	19.175
α Pis. Aus. (*Fomalhaut*)	1.3	22 51 20.982	3.3256	— 30 13 34.28	18.989
* ο Andromedæ . . .	3.7	22 56 40.598	2.7492	+ 41 42 47.86	19.284
α Ursæ Majoris . . S. P.	2.0	22 56 41.146	+ 3.7502	+117 38 1.56	+ 19.359
α Pegasi (*Markab*) . .	2.0	22 59 4.956	2.9848	+ 14 35 31.22	19.299
* φ Aquarii	4.3	23 8 25.124	3.1089	— 6 39 48.07	19.356
ο Cephei	5.3	23 13 56.893	2.4426	+ 67 29 16.56	19.667
* τ Pegasi	4.7	23 14 59.690	2.9632	+ 23 6 58.75	19.654
θ Piscium	4.7	23 22 11.117	+ 3.0410	+ 5 45 9.95	+ 19.725
λ Draconis . . . S. P.	3.3	23 24 37.506	3.6252	+110 2 23.51	19.836
* λ Andromedæ . . .	4.0	23 31 59.179	2.9212	+ 45 50 25.10	19.471
ι Piscium	4.3	23 34 5.218	3.0840	+ 5 0 30.46	19.482
γ Cephei	3.3	23 34 40.308	2.4128	+ 76 59 45.67	20.075
* i^1 Aquarii	5.0	23 38 17.332	+ 3.1173	— 18 54 34.29	+ 19.958
* δ Sculptoris	4.3	23 42 59.247	3.1330	— 28 45 37.34	19.856
* γ^1 Octantis.	5.3	23 45 22.587	3.7012	— 82 39 8.55	19.992
Groombridge 4163 .	7.0	23 49 17.755	2.8620	+ 73 46 33.28	20.022
ω Piscium	4.0	23 53 27.458	3.0782	+ 6 13 55.70	19.931
* 33 Piscium	5.0	23 59 30.028	+ 3.0709	— 6 20 42.91	+ 20.144

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* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	1 17	+88 42	Jan.	6 47	+87 13	Jan.	18 8	+86 36	Jan.	19 36	+88 57
	s	″		s	″		s	″		s	″
0.3	35.02	18.6	0.5	9.43	11.2	1.0	44.17	45.3	1.0	57.82	41.3
1.3	34.21	18.7	1.5	9.54	11.5	2.0	44.15	45.0	2.0	57.35	41.1
2.3	33.39	18.9	2.5	9.66	11.8	3.0	44.13	44.7	3.0	56.83	40.8
3.3	32.53	19.0	3.5	9.78	12.1	4.0	44.12	44.3	4.0	56.31	40.5
4.3	31.62	19.1	4.5	9.90	12.5	5.0	44.12	44.0	5.0	55.78	40.2
5.3	30.65	19.2	5.5	10.01	12.8	6.0	44.14	43.6	6.0	55.31	39.8
6.3	29.62	19.3	6.5	10.08	13.2	7.0	44.18	43.2	7.0	54.89	39.5
7.3	28.55	19.4	7.5	10.12	13.5	8.0	44.24	42.9	8.0	54.57	39.1
8.2	27.46	19.4	8.5	10.13	13.9	9.0	44.32	42.5	9.0	54.31	38.7
9.2	26.39	19.5	9.5	10.10	14.2	9.9	44.42	42.1	10.0	54.14	38.4
10.2	25.34	19.5	10.5	10.05	14.6	10.9	44.53	41.8	11.0	54.02	38.0
11.2	24.35	19.5	11.5	10.00	14.9	11.9	44.64	41.5	12.0	53.94	37.7
12.2	23.42	19.5	12.5	9.95	15.2	12.9	44.76	41.2	13.0	53.85	37.4
13.2	22.54	19.5	13.5	9.90	15.5	13.9	44.86	40.9	14.0	53.74	37.1
14.2	21.69	19.5	14.5	9.88	15.8	14.9	44.94	40.6	15.0	53.59	36.8
15.2	20.84	19.5	15.5	9.86	16.1	15.9	45.02	40.3	16.0	53.40	36.5
16.2	19.97	19.5	16.5	9.88	16.4	16.9	45.09	40.0	17.0	53.19	36.2
17.2	19.06	19.5	17.5	9.87	16.7	17.9	45.17	39.7	18.0	52.97	35.9
18.2	18.12	19.6	18.5	9.88	17.0	18.9	45.27	39.4	19.0	52.77	35.6
19.2	17.13	19.6	19.5	9.87	17.3	19.9	45.37	39.0	20.0	52.59	35.2
20.2	16.09	19.6	20.4	9.83	17.7	20.9	45.50	38.6	21.0	52.47	34.8
21.2	15.02	19.6	21.4	9.76	18.0	21.9	45.65	38.3	22.0	52.45	34.5
22.2	13.94	19.6	22.4	9.65	18.4	22.9	45.82	37.9	23.0	52.53	34.1
23.2	12.88	19.5	23.4	9.51	18.7	23.9	46.01	37.6	24.0	52.67	33.8
24.2	11.87	19.5	24.4	9.35	19.1	24.9	46.22	37.3	25.0	52.88	33.4
25.2	10.93	19.4	25.4	9.18	19.4	25.9	46.42	37.1	26.0	53.10	33.1
26.2	10.04	19.3	26.4	9.01	19.6	26.9	46.62	36.8	27.0	53.34	32.8
27.2	9.19	19.2	27.4	8.86	19.9	27.9	46.81	36.5	28.0	53.55	32.5
28.2	8.36	19.1	28.4	8.71	20.2	28.9	46.99	36.3	29.0	53.72	32.2
29.2	7.54	19.0	29.4	8.59	20.4	29.9	47.17	36.0	30.0	53.85	31.9
30.2	6.71	19.0	30.4	8.46	20.7	30.9	47.34	35.7	31.0	53.99	31.6
31.2	5.83	18.9	31.4	8.34	21.0	31.9	47.53	35.5	32.0	54.13	31.3
32.2	4.90	18.9	32.4	8.21	21.3	32.9	47.73	35.2			

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Feb.	$1^h\ 16^m$	$+88^\circ\ 42'$	Feb.	$6^h\ 47^m$	$+87^\circ\ 13'$	Feb.	$18^h\ 8^m$	$+86^\circ\ 36'$	Feb.	$19^h\ 36^m$	$+88^\circ\ 57'$
	s	"		s	"		s	"		s	"
1.2	64.90	18.9	1.4	8.21	21.3	1.9	47.73	35.2	1.0	54.13	31.3
2.2	63.93	18.8	2.4	8.06	21.6	2.9	47.94	34.9	2.0	54.29	31.0
3.2	62.93	18.7	3.4	7.87	22.0	3.9	48.17	34.5	2.9	54.51	30.6
4.2	61.90	18.6	4.4	7.66	22.3	4.9	48.42	34.2	3.9	54.79	30.3
5.2	60.88	18.4	5.4	7.41	22.6	5.9	48.70	34.0	4.9	55.16	29.9
6.2	59.90	18.3	6.4	7.12	22.9	6.9	48.99	33.7	5.9	55.61	29.5
7.2	58.97	18.1	7.4	6.84	23.2	7.9	49.27	33.5	6.9	56.12	29.2
8.2	58.11	17.9	8.4	6.55	23.4	8.9	49.56	33.2	7.9	56.67	28.9
9.2	57.30	17.7	9.4	6.24	23.7	9.9	49.84	33.0	8.9	57.23	28.6
10.2	56.54	17.6	10.4	5.99	23.9	10.9	50.10	32.8	9.9	57.79	28.3
11.2	55.82	17.4	11.4	5.72	24.1	11.9	50.35	32.6	10.9	58.30	28.0
12.2	55.10	17.3	12.4	5.49	24.3	12.9	50.59	32.4	11.9	58.78	27.8
13.1	54.37	17.1	13.4	5.28	24.6	13.9	50.83	32.2	12.9	59.22	27.5
14.1	53.60	17.0	14.4	5.05	24.8	14.9	51.08	32.0	13.9	59.63	27.2
15.1	52.78	16.8	15.4	4.82	25.1	15.9	51.33	31.8	14.9	60.03	27.0
16.1	51.93	16.7	16.4	4.58	25.3	16.8	51.61	31.5	15.9	60.46	26.7
17.1	51.05	16.5	17.4	4.30	25.6	17.8	51.92	31.3	16.9	60.96	26.3
18.1	50.17	16.3	18.4	3.99	25.9	18.8	52.24	31.0	17.9	61.54	26.0
19.1	49.30	15.1	19.4	3.65	26.2	19.8	52.57	30.8	18.9	62.18	25.7
20.1	48.47	15.9	20.4	3.29	26.4	20.8	52.91	30.6	19.9	62.90	25.4
21.1	47.71	15.7	21.4	2.91	26.6	21.8	53.26	30.5	20.9	63.68	25.1
22.1	47.02	15.4	22.4	2.54	26.8	22.8	53.60	30.3	21.9	64.51	24.9
23.1	46.39	15.2	23.4	2.17	27.0	23.8	53.94	30.2	22.9	65.35	24.6
24.1	45.80	14.9	24.4	1.83	27.1	24.8	54.26	30.1	23.9	66.16	24.4
25.1	45.24	14.7	25.3	1.49	27.3	25.8	54.57	30.0	24.9	66.93	24.2
26.1	44.68	14.5	26.3	1.16	27.5	26.8	54.87	29.8	25.9	67.68	24.0
27.1	44.09	14.3	27.3	0.85	27.6	27.8	55.17	29.7	26.9	68.39	23.8
28.1	43.46	14.1	28.3	0.54	27.8	28.8	55.48	29.5	27.9	69.08	23.5
29.1	42.79	13.9	29.3	0.22	28.0	29.8	55.81	29.4	28.9	69.79	23.3
									29.9	70.52	23.0

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Mar.	h m 1 16	+88° 42′	Mar.	h m 6 46	+87° 13′	Mar.	h m 18 8	+86° 36′	Mar.	h m 19 37	+88° 57′
	s	″		s	″		s	″		s	″
1.1	42.79	13.9	1.3	60.22	28.0	1.8	55.81	29.4	1.9	10.52	23.0
2.1	42.09	13.6	2.3	59.86	28.2	2.8	56.15	29.2	2.9	11.32	22.8
3.1	41.37	13.4	3.3	59.48	28.4	3.8	56.52	29.0	3.9	12.21	22.5
4.1	40.66	13.1	4.3	59.07	28.6	4.8	56.90	28.9	4.9	13.17	22.2
5.1	39.98	12.8	5.3	58.67	28.8	5.8	57.29	28.8	5.9	14.18	22.0
6.1	39.36	12.5	6.3	58.18	29.0	6.8	57.68	28.7	6.9	15.23	21.8
7.1	38.81	12.2	7.3	57.72	29.1	7.8	58.06	28.6	7.9	16.29	21.6
8.1	38.32	11.9	8.3	57.28	29.2	8.8	58.44	28.5	8.9	17.34	21.4
9.1	37.90	11.6	9.3	56.85	29.3	9.8	58.81	28.5	9.9	18.36	21.2
10.1	37.52	11.3	10.3	56.44	29.4	10.8	59.16	28.5	10.8	19.34	21.1
11.1	37.16	11.0	11.3	56.05	29.5	11.8	59.49	28.4	11.8	20.26	20.9
12.1	36.81	10.8	12.3	55.70	29.6	12.8	59.81	28.4	12.8	21.15	20.8
13.1	36.44	10.5	13.3	55.33	29.7	13.8	60.14	28.3	13.8	22.02	20.6
14.1	36.03	10.3	14.3	54.98	29.8	14.8	60.46	28.2	14.8	22.89	20.5
15.1	35.58	10.0	15.3	54.62	29.9	15.8	60.80	28.1	15.8	23.79	20.3
16.1	35.10	9.8	16.3	54.24	30.0	16.8	61.16	28.1	16.8	24.76	20.1
17.1	34.62	9.5	17.3	53.82	30.2	17.8	61.54	28.0	17.8	25.79	19.9
18.1	34.15	9.2	18.3	53.38	30.3	18.8	61.93	27.9	18.8	26.90	19.7
19.1	33.73	8.9	19.3	52.91	30.4	19.8	62.33	27.9	19.8	28.07	19.6
20.1	33.37	8.5	20.3	52.43	30.5	20.8	62.72	27.9	20.8	29.27	19.4
21.1	33.07	8.2	21.3	51.95	30.5	21.8	63.11	27.9	21.8	30.48	19.3
22.1	32.85	7.9	22.3	51.48	30.5	22.8	63.50	28.0	22.8	31.66	19.2
23.1	32.69	7.5	23.3	51.04	30.5	23.8	63.87	28.0	23.8	32.81	19.1
24.0	32.57	7.2	24.3	50.61	30.5	24.7	64.22	28.1	24.8	33.90	19.1
25.0	32.45	6.9	25.3	50.21	30.6	25.7	64.56	28.1	25.8	34.95	19.0
26.0	32.32	6.6	26.3	49.81	30.6	26.7	64.89	28.1	26.8	35.97	18.9
27.0	32.16	6.3	27.3	49.44	30.6	27.7	65.23	28.2	27.8	36.98	18.8
28.0	31.97	6.1	28.3	49.04	30.6	28.7	65.57	28.2	28.8	38.01	18.7
29.0	31.74	5.8	29.3	48.64	30.7	29.7	65.92	28.2	29.8	39.08	18.6
30.0	31.49	5.5	30.3	48.21	30.7	30.7	66.30	28.2	30.8	40.21	18.5
31.0	31.24	5.1	31.3	47.76	30.8	31.7	66.68	28.2	31.8	41.40	18.4
32.0	31.02	4.8	32.3	47.28	30.8	32.7	67.07	28.2	32.8	42.65	18.3

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Apr.	h m 1 16	+88° 41′	Apr.	h m 6 46	+87° 13′	Apr.	h m 18 9	+86° 36′	Apr.	h m 19 37	+88° 57′
	s	″		s	″		s	″		s	″
1.0	31.02	64.8	1.3	47.28	30.8	1.7	7.07	28.2	1.8	42.65	18.3
2.0	30.85	64.5	2.3	46.79	30.8	2.7	7.46	28.3	2.8	43.93	18.2
3.0	30.74	64.1	3.2	46.29	30.8	3.7	7.86	28.4	3.8	45.22	18.1
4.0	30.71	63.8	4.2	45.81	30.7	4.7	8.25	28.5	4.8	46.50	18.1
5.0	30.75	63.4	5.2	45.33	30.7	5.7	8.60	28.6	5.8	47.75	18.1
6.0	30.84	63.1	6.2	44.89	30.6	6.7	8.93	28.8	6.8	48.93	18.1
7.0	30.97	62.7	7.2	44.47	30.5	7.7	9.26	28.9	7.8	50.06	18.1
8.0	31.10	62.5	8.2	44.09	30.5	8.7	9.57	29.0	8.8	51.13	18.2
9.0	31.22	62.2	9.2	43.72	30.4	9.7	9.86	29.1	9.8	52.15	18.2
10.0	31.31	61.9	10.2	43.35	30.3	10.7	10.16	29.2	10.8	53.16	18.2
11.0	31.37	61.6	11.2	42.99	30.3	11.7	10.47	29.3	11.8	54.18	18.1
12.0	31.40	61.4	12.2	42.62	30.3	12.7	10.79	29.4	12.8	55.25	18.1
13.0	31.41	61.1	13.2	42.22	30.2	13.7	11.13	29.5	13.8	56.36	18.1
14.0	31.43	60.7	14.2	41.80	30.2	14.7	11.47	29.6	14.8	57.53	18.1
15.0	31.48	60.4	15.2	41.37	30.1	15.7	11.82	29.7	15.8	58.76	18.1
16.0	31.58	60.1	16.2	40.91	30.0	16.7	12.17	29.9	16.7	60.03	18.1
17.0	31.75	59.7	17.2	40.46	29.9	17.7	12.51	30.1	17.7	61.29	18.1
18.0	31.99	59.4	18.2	40.02	29.8	18.7	12.84	30.3	18.7	62.54	18.2
19.0	32.30	59.1	19.2	39.59	29.7	19.7	13.16	30.5	19.7	63.76	18.3
20.0	32.65	58.8	20.2	39.19	29.5	20.7	13.46	30.7	20.7	64.91	18.4
21.0	33.02	58.5	21.2	38.83	29.3	21.7	13.74	30.9	21.7	65.99	18.5
22.0	33.39	58.2	22.2	38.47	29.2	22.7	14.00	31.1	22.7	67.01	18.6
23.0	33.73	57.9	23.2	38.13	29.0	23.7	14.26	31.2	23.7	68.02	18.7
24.0	34.04	57.7	24.2	37.80	28.9	24.7	14.53	31.4	24.7	69.02	18.7
25.0	34.31	57.4	25.2	37.47	28.8	25.7	14.80	31.6	25.7	70.03	18.8
26.0	34.55	57.1	26.2	37.12	28.7	26.7	15.08	31.7	26.7	71.08	18.8
27.0	34.78	56.9	27.2	36.74	28.6	27.7	15.38	31.9	27.7	72.18	18.9
28.0	35.02	56.6	28.2	36.35	28.5	28.7	15.68	32.1	28.7	73.35	18.9
28.9	35.30	56.3	29.2	35.94	28.3	29.7	15.99	32.3	29.7	74.55	19.0
29.9	35.64	55.9	30.2	35.53	28.2	30.6	16.29	32.5	30.7	75.76	19.1
30.9	36.05	55.6	31.2	35.12	28.0	31.6	16.58	32.8	31.7	76.95	19.3
31.9	36.53	55.3									

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
May	h m 1 16	° ′ +88 41	May	h m 6 46	° ′ +87 13	May	h m 18 9	° ′ +86 36	May	h m 19 38	° ′ +88 57
	s	″		s	″		s	″		s	″
1.9	36.53	55.3	1.2	35.12	28.0	1.6	16.58	32.8	1.7	16.95	19.3
2.9	37.08	55.0	2.2	34.73	27.8	2.6	16.86	33.0	2.7	18.11	19.4
3.9	37.66	54.7	3.2	34.37	27.6	3.6	17.11	33.3	3.7	19.20	19.6
4.9	38.24	54.5	4.2	34.04	27.4	4.6	17.32	33.6	4.7	20.22	19.7
5.9	38.82	54.3	5.2	33.74	27.1	5.6	17.52	33.8	5.7	21.16	19.9
6.9	39.39	54.1	6.2	33.48	26.9	6.6	17.71	34.1	6.7	22.05	20.1
7.9	39.91	53.8	7.2	33.23	26.7	7.6	17.90	34.3	7.7	22.91	20.3
8.9	40.39	53.6	8.2	32.98	26.5	8.6	18.10	34.5	8.7	23.75	20.4
9.9	40.84	53.4	9.1	32.72	26.3	9.6	18.30	34.7	9.7	24.61	20.5
10.9	41.29	53.2	10.1	32.45	26.2	10.6	18.51	35.0	10.7	25.51	20.7
11.9	41.76	52.9	11.1	32.18	26.0	11.6	18.72	35.2	11.7	26.45	20.8
12.9	42.27	52.7	12.1	31.86	25.8	12.6	18.94	35.4	12.7	27.46	21.0
13.9	42.84	52.4	13.1	31.54	25.6	13.6	19.17	35.7	13.7	28.50	21.1
14.9	43.48	52.2	14.1	31.22	25.4	14.6	19.39	36.0	14.7	29.53	21.3
15.9	44.18	51.9	15.1	30.91	25.1	15.6	19.60	36.3	15.7	30.53	21.5
16.9	44.92	51.7	16.1	30.62	24.9	16.6	19.78	36.6	16.7	31.50	21.7
17.9	45.68	51.5	17.1	30.36	24.6	17.6	19.95	36.9	17.7	32.40	22.0
18.9	46.46	51.2	18.1	30.13	24.3	18.6	20.10	37.2	18.7	33.24	22.2
19.9	47.21	51.1	19.1	29.92	24.0	19.6	20.24	37.5	19.7	34.03	22.4
20.9	47.93	50.9	20.1	29.73	23.8	20.6	20.36	37.8	20.7	34.75	22.7
21.9	48.60	50.7	21.1	29.56	23.5	21.6	20.48	38.1	21.7	35.43	22.9
22.9	49.23	50.6	22.1	29.39	23.3	22.6	20.60	38.3	22.6	36.13	23.1
23.9	49.84	50.4	23.1	29.20	23.1	23.6	20.73	38.6	23.6	36.86	23.3
24.9	50.44	50.2	24.1	29.00	22.8	24.6	20.87	38.8	24.6	37.62	23.5
25.9	51.06	50.0	25.1	28.78	22.6	25.6	21.02	39.1	25.6	38.42	23.7
26.9	51.73	49.8	26.1	28.55	22.4	26.6	21.17	39.4	26.6	39.25	23.9
27.9	52.46	49.6	27.1	28.30	22.1	27.6	21.32	39.7	27.6	40.10	24.1
28.9	53.27	49.4	28.1	28.06	21.8	28.6	21.46	40.0	28.6	40.94	24.3
29.9	54.13	49.2	29.1	27.85	21.6	29.6	21.59	40.4	29.6	41.75	24.6
30.9	55.03	49.0	30.1	27.64	21.3	30.6	21.69	40.7	30.6	42.51	24.9
31.9	55.95	48.9	31.1	27.49	20.9	31.6	21.76	41.0	31.6	43.18	25.2
32.9	56.86	48.8	32.1	27.36	20.6	32.6	21.82	41.4	32.6	43.77	25.5

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
June	h m 1 16	+88° 41′	June	h m 6 46	+87° 13′	June	h m 18 9	+86° 36′	June	h m 19 38	+88° 57′
	s	″		s	″		s	″		s	″
1.9	56.86	48.8	1.1	27.36	20.6	1.6	21.82	41.4	1.6	43.77	25.5
2.9	57.74	48.7	2.1	27.27	20.3	2.6	21.86	41.7	2.6	44.28	25.8
3.9	58.58	48.6	3.1	27.19	20.0	3.6	21.88	42.0	3.6	44.74	26.0
4.8	59.38	48.5	4.1	27.13	19.7	4.6	21.91	42.3	4.6	45.18	26.3
5.8	60.14	48.4	5.1	27.07	19.4	5.6	21.93	42.6	5.6	45.61	26.6
6.8	60.88	48.3	6.1	27.01	19.2	6.5	21.96	42.9	6.6	46.08	26.8
7.8	61.62	48.2	7.1	26.92	18.9	7.5	22.01	43.1	7.6	46.59	27.0
8.8	62.38	48.1	8.1	26.82	18.7	8.5	22.07	43.4	8.6	47.13	27.3
9.8	63.19	48.0	9.1	26.71	18.4	9.5	22.12	43.7	9.6	47.70	27.6
10.8	64.07	47.8	10.1	26.58	18.1	10.5	22.18	44.1	10.6	48.29	27.8
11.8	65.01	47.7	11.1	26.46	17.8	11.5	22.22	44.4	11.6	48.87	28.1
12.8	65.99	47.6	12.1	26.36	17.5	12.5	22.24	44.8	12.6	49.41	28.4
13.8	66.99	47.5	13.1	26.28	17.1	13.5	22.24	45.1	13.6	49.89	28.8
14.8	68.00	47.5	14.1	26.25	16.8	14.5	22.23	45.5	14.6	50.28	29.1
15.8	69.00	47.4	15.1	26.24	16.5	15.5	22.19	45.8	15.6	50.60	29.5
16.8	69.95	47.4	16.0	26.24	16.1	16.5	22.14	46.1	16.6	50.87	29.8
17.8	70.85	47.4	17.0	26.28	15.8	17.5	22.08	46.5	17.6	51.10	30.1
18.8	71.71	47.3	18.0	26.30	15.5	18.5	22.03	46.8	18.6	51.31	30.4
19.8	72.53	47.3	19.0	26.34	15.3	19.5	21.98	47.0	19.6	51.52	30.6
20.8	73.33	47.3	20.0	26.34	15.0	20.5	21.94	47.3	20.6	51.77	30.9
21.8	74.13	47.2	21.0	26.34	14.7	21.5	21.92	47.6	21.6	52.07	31.2
22.8	74.96	47.1	22.0	26.32	14.4	22.5	21.90	47.9	22.6	52.40	31.4
23.8	75.84	47.1	23.0	26.28	14.1	23.5	21.87	48.2	23.6	52.74	31.7
24.8	76.77	47.0	24.0	26.24	13.9	24.5	21.84	48.5	24.6	53.09	32.0
25.8	77.77	47.0	25.0	26.24	13.5	25.5	21.79	48.9	25.6	53.41	32.4
26.8	78.83	47.0	26.0	26.23	13.2	26.5	21.73	49.2	26.6	53.67	32.7
27.8	79.90	46.9	27.0	26.27	12.9	27.5	21.65	49.6	27.6	53.85	33.1
28.8	80.97	47.0	28.0	26.34	12.5	28.5	21.53	49.9	28.5	53.95	33.4
29.8	82.00	47.0	29.0	26.45	12.2	29.5	21.39	50.3	29.5	53.97	33.8
30.8	82.99	47.1	30.0	26.59	11.8	30.5	21.24	50.6	30.5	53.93	34.1
31.8	83.92	47.1	31.0	26.72	11.5	31.5	21.09	50.9	31.5	53.84	34.5

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
July	h m 1 17	+88° 41′	July	h m 6 46	+87° 13′	July	h m 18 9	+86° 36′	July	h m 19 38	+88° 57′
	s	″		s	″		s	″		s	″
1.8	23.92	47.1	1.0	26.72	11.5	1.5	21.09	50.9	1.5	53.84	34.5
2.8	24.81	47.2	2.0	26.88	11.2	2.5	20.94	51.2	2.5	53.74	34.8
3.8	25.66	47.2	3.0	27.03	10.9	3.5	20.80	51.4	3.5	53.66	35.1
4.8	26.51	47.3	4.0	27.15	10.7	4.5	20.67	51.7	4.5	53.61	35.4
5.8	27.36	47.3	5.0	27.27	10.4	5.5	20.54	51.9	5.5	53.60	35.6
6.8	28.23	47.3	6.0	27.37	10.1	6.5	20.42	52.2	6.5	53.64	35.9
7.8	29.16	47.4	7.0	27.46	9.8	7.5	20.31	52.5	7.5	53.70	36.3
8.8	30.16	47.4	8.0	27.54	9.5	8.5	20.19	52.9	8.5	53.74	36.6
9.8	31.20	47.4	9.0	27.64	9.2	9.5	20.04	53.2	9.5	53.75	36.9
10.7	32.26	47.5	10.0	27.77	8.9	10.5	19.88	53.5	10.5	53.70	37.3
11.7	33.32	47.5	11.0	27.91	8.5	11.5	19.71	53.8	11.5	53.59	37.7
12.7	34.37	47.6	12.0	28.09	8.2	12.4	19.51	54.2	12.5	53.40	38.0
13.7	35.39	47.8	13.0	28.31	7.8	13.4	19.30	54.5	13.5	53.14	38.4
14.7	36.35	47.9	14.0	28.53	7.5	14.4	19.08	54.8	14.5	52.82	38.7
15.7	37.25	48.0	15.0	28.78	7.3	15.4	18.86	55.0	15.5	52.49	39.1
16.7	38.10	48.1	16.0	29.01	7.0	16.4	18.65	55.3	16.5	52.17	39.4
17.7	38.93	48.2	17.0	29.25	6.7	17.4	18.45	55.5	17.5	51.86	39.7
18.7	39.74	48.3	18.0	29.45	6.5	18.4	18.25	55.8	18.5	51.57	40.0
19.7	40.55	48.4	19.0	29.64	6.2	19.4	18.06	56.0	19.5	51.33	40.2
20.7	41.41	48.5	20.0	29.82	5.9	20.4	17.88	56.3	20.5	51.13	40.5
21.7	42.32	48.6	20.9	29.98	5.7	21.4	17.69	56.5	21.5	50.94	40.8
22.7	43.28	48.7	21.9	30.15	5.4	22.4	17.49	56.8	22.5	50.72	41.2
23.7	44.28	48.8	22.9	30.36	5.1	23.4	17.27	57.1	23.5	50.46	41.5
24.7	45.31	48.9	23.9	30.57	4.8	24.4	17.03	57.4	24.5	50.14	41.9
25.7	46.34	49.1	24.9	30.83	4.4	25.4	16.77	57.7	25.5	49.73	42.2
26.7	47.35	49.3	25.9	31.11	4.1	26.4	16.48	58.0	26.5	49.24	42.6
27.7	48.31	49.5	26.9	31.43	3.8	27.4	16.18	58.3	27.5	48.67	42.9
28.7	49.22	49.7	27.9	31.77	3.5	28.4	15.88	58.5	28.5	48.05	43.3
29.7	50.06	49.9	28.9	32.10	3.3	29.4	15.58	58.7	29.5	47.41	43.6
30.7	50.87	50.1	29.9	32.45	3.0	30.4	15.28	58.9	30.5	46.78	43.9
31.7	51.65	50.2	30.9	32.78	2.8	31.4	15.00	59.1	31.5	46.18	44.1
32.7	52.41	50.4	31.9	33.09	2.6	32.4	14.72	59.4	32.5	45.62	44.4
			32.9	33.38	2.3						

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Aug.	1 17	+88 41	Aug.	6 46	+87 12	Aug.	18 9	+86 36	Aug.	19 38	+88 57
	s	″		s	″		s	″		s	″
1.7	52.41	50.4	1.9	33.38	62.3	1.4	14.72	59.4	1.5	45.62	44.4
2.7	53.19	50.6	2.9	33.67	62.1	2.4	14.45	59.6	2.5	45.10	44.7
3.7	54.01	50.8	3.9	33.94	61.8	3.4	14.18	59.8	3.5	44.61	45.0
4.7	54.88	50.9	4.9	34.21	61.6	4.4	13.92	60.0	4.4	44.14	45.3
5.7	55.80	51.1	5.9	34.51	61.3	5.4	13.65	60.3	5.4	43.64	45.6
6.7	56.75	51.3	6.9	34.83	61.0	6.4	13.35	60.5	6.4	43.10	46.0
7.7	57.71	51.5	7.9	35.18	60.7	7.4	13.04	60.8	7.4	42.49	46.3
8.7	58.66	51.7	8.9	35.56	60.4	8.4	12.71	61.0	8.4	41.81	46.6
9.7	59.58	51.9	9.9	35.94	60.2	9.4	12.37	61.3	9.4	41.06	47.0
10.7	60.44	52.2	10.9	36.37	59.9	10.4	12.02	61.5	10.4	40.25	47.3
11.7	61.23	52.5	11.9	36.77	59.7	11.4	11.66	61.7	11.4	39.41	47.6
12.7	61.96	52.7	12.9	37.19	59.5	12.4	11.31	61.8	12.4	38.57	47.9
13.7	62.65	52.9	13.9	37.56	59.3	13.4	10.97	62.0	13.4	37.74	48.1
14.7	63.31	53.2	14.9	37.92	59.1	14.4	10.64	62.1	14.4	36.95	48.4
15.7	63.97	53.4	15.9	38.27	58.9	15.4	10.32	62.3	15.4	36.21	48.6
16.6	64.66	53.6	16.9	38.60	58.7	16.4	10.01	62.5	16.4	35.50	48.9
17.6	65.39	53.8	17.9	38 93	58.5	17.4	9.70	62.6	17.4	34.80	49.1
18.6	66.17	54.1	18.9	39.29	58.3	18.3	9.38	62.8	18.4	34.10	49.4
19.6	66.98	54.3	19.9	39.64	58.0	19.3	9.05	63.0	19.4	33.37	49.7
20.6	67.82	54.5	20.9	40.05	57.8	20.3	8.71	63.2	20.4	32.58	50.0
21.6	68.67	54.8	21.9	40.47	57.5	21.3	8.35	63.4	21.4	31.73	50.3
22.6	69.51	55.1	22.9	40.94	57.3	22.3	8.96	63.6	22.4	30.80	50.6
23.6	70.30	55.4	23.9	41.42	57.1	23.3	7.55	63.8	23.4	29.80	50.9
24.6	71.03	55.7	24.9	41.89	56.9	24.3	7.13	63.9	24.4	28.73	51.2
25.6	71.70	56.0	25.8	42.39	56.7	25.3	6.72	64.1	25.4	27.64	51.5
26.6	72.32	56.4	26.8	42.88	56.6	26.3	6.32	64.2	26.4	26.54	51.7
27.6	72.89	56.7	27.8	43.33	56.4	27.3	5.92	64.3	27.4	25.46	51.9
28.6	73.44	57.0	28.8	43.79	56.3	28.3	5.54	64.4	28.4	24.44	52.1
29.6	74.00	57.3	29.8	44.20	56.1	29.3	5.17	64.5	29.4	23.46	52.4
30.6	74.58	57.5	30.8	44.60	56.0	30.3	4.81	64.6	30.4	22.53	52.6
31.6	75.20	57.8	31.8	45.01	55.8	31.3	4.45	64.7	31.4	21.62	52.8
32.6	75.86	58.1	32.8	45.42	55.6	32.3	4.09	64.8	32.4	20.70	53.0

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	*δ* Ursæ Minoris.		Mean Solar Date.	*λ* Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Sept.	h m 1 18	+88° 41′	Sept.	h m 6 46	+87° 12′	Sept.	h m 18 8	+86° 37′	Sept.	h m 19 37	+88° 57′
	s	″		s	″		s	″		s	″
1.6	15.86	58.1	1.8	45.42	55.6	1.3	64.09	4.8	1.4	80.70	53.0
2.6	16.57	58.3	2.8	45.86	55.4	2.3	63.71	5.0	2.4	79.75	53.3
3.6	17.29	58.7	3.8	46.33	55.2	3.3	63.31	5.1	3.4	78.74	53.6
4.6	18.00	59.0	4.8	46.82	55.0	4.3	62.90	5.3	4.4	77.66	53.8
5.6	18.68	59.3	5.8	47.34	54.9	5.3	62.48	5.4	5.4	76.51	54.1
6.6	19.30	59.7	6.8	47.86	54.7	6.3	62.05	5.5	6.4	75.31	54.3
7.6	19.87	60.0	7.8	48.40	54.6	7.3	61.61	5.6	7.4	74.07	54.6
8.6	20.38	60.4	8.8	48.91	54.5	8.3	61.18	5.6	8.4	72.83	54.8
9.6	20.83	60.7	9.8	49.43	54.4	9.3	60.76	5.7	9.4	71.60	55.0
10.6	21.23	61.1	10.8	49.91	54.3	10.3	60.35	5.7	10.3	70.40	55.1
11.6	21.60	61.4	11.8	50.37	54.2	11.3	59.95	5.7	11.3	69.24	55.3
12.6	22.00	61.7	12.8	50.80	54.1	12.3	59.57	5.8	12.3	68.14	55.5
13.6	22.43	62.0	13.8	51.24	54.0	13.3	59.20	5.8	13.3	67.08	55.6
14.6	22.90	62.3	14.8	51.67	53.9	14.3	58.82	5.9	14.3	66.03	55.8
15.6	23.42	62.6	15.8	52.13	53.8	15.3	58.44	5.9	15.3	64.96	56.0
16.6	23.97	62.9	16.8	52.60	53.6	16.3	58.04	6.0	16.3	63.84	56.2
17.6	24.52	63.3	17.8	53.11	53.5	17.3	57.62	6.1	17.3	62.65	56.4
18.6	25.07	63.6	18.8	53.65	53.4	18.3	57.18	6.2	18.3	61.40	56.6
19.6	25.58	64.0	19.8	54.21	53.3	19.3	56.72	6.2	19.3	60.03	56.9
20.6	26.03	64.4	20.8	54.79	53.2	20.3	56.26	6.3	20.3	58.73	57.0
21.6	26.42	64.8	21.8	55.35	53.1	21.3	55.80	6.3	21.3	57.32	57.2
22.5	26.74	65.2	22.8	55.91	53.0	22.3	55.35	6.3	22.3	55.89	57.3
23.5	27.00	65.6	23.8	56.46	53.0	23.3	54.90	6.3	23.3	54.49	57.5
24.5	27.24	66.0	24.8	56.98	53.0	24.2	54.46	6.2	24.3	53.14	57.6
25.5	27.47	66.3	25.8	57.47	53.0	25.2	54.04	6.2	25.3	51.83	57.7
26.5	27.71	66.7	26.8	57.97	52.9	26.2	53.64	6.1	26.3	50.58	57.8
27.5	27.98	67.0	27.8	58.43	52.9	27.2	53.25	6.1	27.3	49.37	57.9
28.5	28.30	67.3	28.8	58.91	52.8	28.2	52.86	6.1	28.3	48.18	58.0
29.5	28.66	67.7	29.8	59.40	52.7	29.2	52.46	6.1	29.3	46.96	58.2
30.5	29.04	68.0	30.8	59.91	52.6	30.2	52.04	6.1	30.3	45.71	58.3
31.5	29.41	68.4	31.8	60.45	52.6	31.2	51.61	6.1	31.3	44.41	58.5

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Oct.	h m 1 18	° ′ +88 42	Oct.	h m 6 47	° ′ +87 12	Oct.	h m 18 8	° ′ +86 37	Oct.	h m 19 37	° ′ +88 57
	s	″		s	″		s	″		s	″
1.5	29.41	8.4	1.8	0.45	52.6	1.2	51.61	6.1	1.3	44.41	58.5
2.5	29.75	8.8	2.7	1.01	52.5	2.2	51.17	6.1	2.3	43.05	58.6
3.5	30.05	9.2	3.7	1.57	52.5	3.2	50.72	6.1	3.3	41.63	58.8
4.5	30.29	9.6	4.7	2.17	52.5	4.2	50.27	6.1	4.3	40.17	58.9
5.5	30.47	10.0	5.7	2.73	52.5	5.2	49.81	6.0	5.3	38.68	59.0
6.5	30.58	10.4	6.7	3.29	52.5	6.2	49.37	5.9	6.3	37.21	59.1
7.5	30.64	10.8	7.7	3.82	52.5	7.2	48.94	5.8	7.3	35.78	59.1
8.5	30.66	11.2	8.7	4.32	52.6	8.2	48.54	5.7	8.3	34.40	59.2
9.5	30.68	11.5	9.7	4.80	52.6	9.2	48.15	5.6	9.3	33.07	59.2
10.5	30.73	11.9	10.7	5.27	52.6	10.2	47.77	5.5	10.3	31.80	59.2
11.5	30.81	12.2	11.7	5.73	52.6	11.2	47.39	5.4	11.3	30.56	59.3
12.5	30.94	12.5	12.7	6.22	52.6	12.2	47.01	5.4	12.3	29.33	59.3
13.5	31.10	12.9	13.7	6.69	52.6	13.2	46.62	5.3	13.3	28.06	59.4
14.5	31.28	13.2	14.7	7.22	52.6	14.2	46.22	5.3	14.3	26.74	59.5
15.5	31.45	13.6	15.7	7.77	52.6	15.2	45.80	5.2	15.3	25.37	59.6
16.5	31.59	14.0	16.7	8.34	52.7	16.2	45.37	5.1	16.2	23.94	59.7
17.5	31.68	14.4	17.7	8.92	52.7	17.2	44.93	5.0	17.2	22.46	59.7
18.5	31.71	14.9	18.7	9.49	52.7	18.2	44.49	4.9	18.2	20.93	59.8
19.5	31.67	15.3	19.7	10.07	52.8	19.2	44.05	4.8	19.2	19.38	59.8
20.5	31.57	15.7	20.7	10.63	52.9	20.2	43.63	4.6	20.2	17.86	59.8
21.5	31.42	16.1	21.7	11.16	53.0	21.2	43.22	4.4	21.2	16.37	59.8
22.5	31.26	16.5	22.7	11.67	53.1	22.2	42.83	4.3	22.2	14.96	59.8
23.5	31.10	16.8	23.7	12.14	53.2	23.2	42.45	4.1	23.2	13.60	59.7
24.5	30.97	17.2	24.7	12.60	53.3	24.2	42.09	4.0	24.2	12.31	59.7
25.5	30.87	17.5	25.7	13.07	53.4	25.2	41.74	3.8	25.2	11.03	59.7
26.5	30.81	17.8	26.7	13.53	53.4	26.2	41.39	3.7	26.2	9.76	59.7
27.5	30.78	18.2	27.7	14.02	53.5	27.2	41.02	3.6	27.2	8.47	59.7
28.5	30.75	18.6	28.7	14.53	53.5	28.2	40.64	3.4	28.2	7.14	59.7
29.4	30.71	18.9	29.7	15.06	53.6	29.2	40.26	3.3	29.2	5.75	59.8
30.4	30.63	19.3	30.7	15.61	53.7	30.1	39.87	3.2	30.2	4.31	59.8
31.4	30.49	19.7	31.7	16.14	53.8	31.1	39.46	3.0	31.2	2.84	59.7
32.4	30.28	20.1	32.7	16.69	53.9	32.1	39.06	2.8	32.2	1.35	59.7

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Nov.	h m 1 18	+88° 42′	Nov.	h m 6 47	+87° 12′	Nov.	h m 18 8	+86° 36′	Nov.	h m 19 36	+88° 57′
	s	″		s	″		s	″		s	″
1.4	30.28	20.1	1.7	16.69	53.9	1.1	39.06	62.8	1.2	61.35	59.7
2.4	30.00	20.5	2.7	17.21	54.1	2.1	38.68	62.6	2.2	59.87	59.7
3.4	29.67	20.9	3.7	17.71	54.3	3.1	38.32	62.4	3.2	58.43	59.6
4.4	29.30	21.3	4.7	18.19	54.4	4.1	37.97	62.1	4.2	57.04	59.5
5.4	28.91	21.6	5.7	18.63	54.6	5.1	37.64	61.9	5.2	55.71	59.4
6.4	28.53	21.9	6.7	19.05	54.8	6.1	37.32	61.7	6.2	54.45	59.3
7.4	28.18	22.2	7.7	19.46	54.9	7.1	37.02	61.4	7.2	53.24	59.1
8.4	27.87	22.5	8.6	19.87	55.0	8.1	36.72	61.2	8.2	52.06	59.1
9.4	27.60	22.9	9.6	20.29	55.2	9.1	36.42	61.0	9.2	50.68	59.0
10.4	27.36	23.2	10.6	20.73	55.3	10.1	36.11	60.9	10.2	49.65	58.9
11.4	27.12	23.5	11.6	21.18	55.4	11.1	35.78	60.7	11.2	48.38	58.9
12.4	26.86	23.9	12.6	21.67	55.6	12.1	35.44	60.5	12.2	47.06	58.8
13.4	26.56	24.3	13.6	22.18	55.7	13.1	35.09	60.2	13.2	45.69	58.7
14.4	26.20	24.6	14.6	22.68	55.9	14.1	34.73	60.0	14.2	44.28	58.6
15.4	25.77	25.0	15.6	23.17	56.1	15.1	34.38	59.8	15.2	42.85	58.5
16.4	25.27	25.4	16.6	23.65	56.3	16.1	34.05	59.5	16.2	41.43	58.4
17.4	24.72	25.7	17.6	24.10	56.5	17.1	33.73	59.2	17.2	40.06	58.2
18.4	24.15	26.1	18.6	24.53	56.8	18.1	33.43	58.9	18.2	38.75	58.1
19.4	23.58	26.4	19.6	24.94	57.0	19.1	33.16	58.6	19.2	37.52	57.9
20.4	23.02	26.7	20.6	25.30	57.2	20.1	32.91	58.3	20.2	36.36	57.7
21.4	22.49	27.0	21.6	25.66	57.4	21.1	32.67	58.1	21.1	35.26	57.6
22.4	22.00	27.2	22.6	26.02	57.6	22.1	32.43	57.8	22.1	34.17	57.4
23.4	21.55	27.5	23.6	26.39	57.8	23.1	32.19	57.6	23.1	33.08	57.3
24.4	21.12	27.8	24.6	26.78	58.0	24.1	31.93	57.3	24.1	31.97	57.1
25.4	20.68	28.1	25.6	27.18	58.2	25.1	31.67	57.1	25.1	30.83	57.0
26.4	20.21	28.4	26.6	27.59	58.4	26.1	31.40	56.8	26.1	29.64	56.9
27.4	19.69	28.7	27.6	28.01	58.6	27.1	31.13	56.6	27.1	28.41	56.7
28.4	19.11	29.1	28.6	28.44	58.8	28.1	30.86	56.3	28.1	27.16	56.6
29.4	18.46	29.4	29.6	28.84	59.1	29.1	30.60	56.0	29.1	25.92	56.4
30.4	17.75	29.7	30.6	29.22	59.4	30.1	30.35	55.6	30.1	24.71	56.1
31.4	16.99	30.0	31.6	29.56	59.7	31.1	30.13	55.3	31.1	23.57	55.9

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascen-sion.	Declina-tion *North.*		Right Ascen-sion.	Declina-tion *North.*		Right Ascen-sion.	Declina-tion *North.*		Right Ascen-sion.	Declina-tion *North.*
Dec.	h m 1 17	+88° 42′	Dec.	h m 6 47	+87° 12′	Dec.	h m 18 8	+86° 36′	Dec.	h m 19 35	+88° 57′
	s	″		s	″		s	″		s	″
1.4	76.99	30.0	1.6	29.56	59.7	1.1	30.13	55.3	1.1	83.57	55.9
2.4	76.21	30.2	2.6	29.87	60.0	2.1	29.94	55.0	2.1	82.50	55.7
3.4	75.43	30.5	3.6	30.15	60.2	3.1	29.77	54.6	3.1	81.51	55.4
4.3	74.68	30.7	4.6	30.44	60.5	4.1	29.61	54.3	4.1	80.58	55.2
5.3	73.98	30.9	5.6	30.69	60.8	5.0	29.45	54.0	5.1	79.69	54.9
6.3	73.31	31.2	6.6	30.97	61.0	6.0	29.30	53.7	6.1	78.81	54.7
7.3	72.68	31.4	7.6	31.24	61.2	7.0	29.14	53.4	7.1	77.93	54.5
8.3	72.07	31.6	8.6	31.54	61.5	8.0	28.98	53.1	8.1	77.02	54.3
9.3	71.45	31.8	9.6	31.85	61.7	9.0	28.80	52.8	9.1	76.06	54.1
10.3	70.80	32.1	10.6	32.18	62.0	10.0	28.60	52.6	10.1	75.05	53.9
11.3	70.10	32.4	11.6	32.52	62.2	11.0	28.41	52.2	11.1	74.02	53.7
12.3	69.33	32.6	12.6	32.84	62.5	12.0	28.22	51.9	12.1	72.97	53.5
13.3	68.50	32.9	13.6	33.16	62.8	13.0	28.05	51.6	13.1	71.93	53.2
14.3	67.62	33.1	14.5	33.45	63.2	14.0	27.89	51.2	14.1	70.94	52.9
15.3	66.70	33.3	15.5	33.71	63.5	15.0	27.75	50.8	15.1	70.01	52.7
16.3	65.78	33.5	16.5	33.93	63.8	16.0	27.64	50.4	16.1	69.15	52.4
17.3	64.88	33.7	17.5	34.13	64.2	17.0	27.55	50.1	17.1	68.38	52.0
18.3	64.00	33.9	18.5	34.29	64.5	18.0	27.47	49.7	18.1	67.68	51.8
19.3	63.16	34.1	19.5	34.46	64.8	19.0	27.40	49.4	19.1	67.02	51.5
20.3	62.37	34.2	20.5	34.63	65.0	20.0	27.33	49.1	20.1	66.38	51.2
21.3	61.62	34.4	21.5	34.82	65.3	21.0	27.27	48.8	21.1	65.73	51.0
22.3	60.87	34.5	22.5	35.01	65.6	22.0	27.19	48.5	22.1	65.05	50.7
23.3	60.11	34.7	23.5	35.22	65.8	23.0	27.10	48.2	23.1	64.34	50.5
24.3	59.31	34.9	24.5	35.44	66.1	24.0	27.01	47.9	24.1	63.60	50.2
25.3	58.45	35.1	25.5	35.65	66.4	25.0	26.92	47.5	25.1	62.83	49.9
26.3	57.53	35.3	26.5	35.86	66.8	26.0	26.83	47.2	26.1	62.08	49.7
27.3	56.56	35.4	27.5	36.03	67.1	27.0	26.76	46.8	27.1	61.37	49.3
28.3	55.54	35.6	28.5	36.19	67.5	28.0	26.73	46.4	28.1	60.71	49.0
29.3	54.50	35.7	29.5	36.29	67.8	29.0	26.71	46.0	29.1	60.12	48.7
30.3	53.46	35.8	30.5	36.33	68.2	30.0	26.71	45.6	30.1	59.61	48.3
31.3	52.44	35.9	31.5	36.42	68.6	31.0	26.72	45.3	31.1	59.19	48.0
32.3	51.46	36.0	32.5	36.45	68.9	32.0	26.76	44.9	32.1	58.83	47.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*a* Andromedæ.		γ Pegasi. (*Algenib.*)		β Hydri		12 Ceti.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 0 2	° ′ +28 27	h m 0 7	° ′ +14 32	h m 0 19	° ′ −77 53	h m 0 24	° ′ − 4 34
	s	″	s	″	s	″	s	″
(Dec. 30.2)	29.72 −.15	46.8 −0.8	21.79 −.13	61.3 −0.8	41.04 −.93	69.0 +0.7	12.96 −.12	79.3 −0.7
Jan. 9.2	29.57 .15	45.8 1.1	21.66 .12	60.4 1.0	40.14 .88	68.1 1.3	12.84 .12	80.0 0.6
19.2	29.43 .14	44.6 1.4	21.54 .12	59.4 1.0	39.29 .81	66.5 1.8	12.73 .11	80.5 0.5
29.1	29.30 .12	43.1 1.5	21.43 .10	58.3 1.1	38.52 .71	64.4 2.4	12.62 .10	81.0 0.4
Feb. 8.1	29.19 .10	41.5 1.6	21.34 .08	57.2 1.1	37.86 .60	61.8 2.8	12.52 .09	81.3 0.2
18.1	29.10 −.07	39.8 −1.7	21.26 −.06	56.2 −1.0	37.32 −.47	58.8 +3.1	12.44 −.07	81.5 −0.1
28.1	29.05 −.04	38.1 1.7	21.22 −.03	55.2 0.9	36.91 .33	55.5 3.4	12.38 .04	81.4 +0.1
Mar. 10.0	29.03 .00	36.5 1.5	21.20 .00	54.3 0.8	36.65 .19	51.9 3.6	12.36 −.01	81.2 0.4
20.0	29.05 +.04	35.0 1.4	21.22 +.04	53.6 0.6	36.54 −.03	48.2 3.7	12.36 +.02	80.7 0.6
30.0	29.12 .09	33.8 1.1	21.28 .08	53.2 −0.3	36.59 +.13	44.4 3.8	12.40 .06	80.0 0.8
Apr. 9.0	29.23 +.14	32.8 −0.8	21.38 +.12	53.0 0.0	36.80 +.28	40.6 +3.7	12.48 +.10	79.1 +1.1
19.0	29.39 .18	32.2 −0.5	21.52 .16	53.1 +0.3	37.16 .44	36.9 3.6	12.60 .14	77.9 1.3
28.9	29.59 .22	31.9 0.0	21.71 .20	53.6 0.6	37.68 .59	33.4 3.4	12.77 .18	76.5 1.5
May 8.9	29.84 .26	32.0 +0.3	21.93 .24	54.3 0.9	38.34 .72	30.2 3.1	12.97 .22	74.8 1.7
18.9	30.11 .29	32.5 0.7	22.18 .27	55.4 1.2	39.12 .84	27.2 2.7	13.20 .25	73.0 1.9
28.8	30.42 +.31	33.4 +1.1	22.46 +.29	56.7 +1.5	40.02 +.94	24.7 +2.3	13.46 +.27	71.1 +2.0
June 7.8	30.74 .33	34.6 1.4	22.76 .30	58.3 1.7	41.01 1.02	22.6 1.9	13.75 .29	69.1 2.0
17.8	31.07 .33	36.2 1.7	23.07 .31	60.1 1.9	42.07 1.08	20.9 1.4	14.05 .30	67.1 2.0
27.7	31.41 .33	38.1 2.0	23.38 .31	62.0 2.0	43.17 1.10	19.8 0.8	14.35 .30	65.1 2.0
July 7.7	31.73 .31	40.2 2.2	23.69 .30	64.1 2.1	44.28 1.10	19.3 +0.2	14.66 .30	63.2 1.9
17.7	32.04 +.30	42.4 +2.3	23.98 +.28	66.2 +2.1	45.37 1.07	19.4 −0.3	14.95 +.29	61.4 +1.7
27.7	32.32 .27	44.8 2.4	24.26 .26	68.3 2.1	46.42 1.01	20.0 0.9	15.23 .27	59.8 1.5
Aug. 6.6	32.58 .24	47.3 2.5	24.50 .23	70.3 2.0	47.39 .91	21.2 1.4	15.48 .24	58.3 1.3
16.6	32.80 .20	49.7 2.4	24.71 .19	72.3 1.9	48.25 .79	22.8 1.9	15.71 .21	57.2 1.0
26.6	32.98 .16	52.1 2.3	24.89 .16	74.1 1.7	48.97 .64	25.0 2.4	15.90 .17	56.3 0.8
Sept. 5.6	33.12 +.12	54.4 +2.2	25.03 +.12	75.8 +1.5	49.53 +.47	27.6 −2.7	16.05 +.14	55.6 +0.5
15.5	33.22 .08	56.6 2.1	25.13 .08	77.2 1.3	49.92 .29	30.4 2.9	16.17 .10	55.3 +0.2
25.5	33.27 +.04	58.6 1.9	25.19 .04	78.4 1.1	50.12 +.10	33.4 3.1	16.25 .06	55.2 0.0
Oct. 5.5	33.29 .00	60.4 1.7	25.22 +.01	79.4 0.9	50.13 −.09	36.6 3.1	16.29 +.03	55.4 −0.2
15.5	33.28 −.03	62.0 1.4	25.21 −.02	80.2 0.7	49.95 .27	39.7 3.0	16.30 .00	55.7 0.4
25.4	33.23 −.06	63.3 +1.2	25.18 −.05	80.8 +0.4	49.59 −.44	42.6 −2.8	16.29 −.03	56.2 −0.6
Nov. 4.4	33.16 .09	64.4 0.9	25.12 .07	81.1 +0.2	49.07 .59	45.2 2.5	16.24 .06	56.9 0.7
14.4	33.06 .11	65.1 0.6	25.04 .09	81.2 0.0	48.40 .72	47.5 2.0	16.17 .07	57.7 0.8
24.3	32.94 .12	65.5 +0.3	24.94 .10	81.1 −0.2	47.63 .82	49.3 1.5	16.09 .09	58.5 0.8
Dec. 4.3	32.81 .14	65.7 0.0	24.83 .11	80.8 0.4	46.76 .89	50.5 0.9	15.99 .10	59.3 0.8
14.3	32.67 −.14	65.5 −0.3	24.71 −.12	80.3 −0.6	45.85 −.92	51.2 −0.3	15.88 −.11	60.2 −0.8
24.3	32.52 .15	65.0 0.6	24.59 .12	79.7 0.7	44.92 .93	51.2 +0.3	15.77 .12	60.9 0.7
34.2	32.37 −.15	64.2 −0.9	24.46 −.13	78.9 −0.9	43.99 −.92	50.6 +0.9	15.65 −.12	61.7 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*a* Cassiopeæ.		*β* Ceti.		21 Cassiopeæ.		*ε* Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 0 34	° ′ +55 54	h m 0 37	° ′ −18 36	h m 0 38	° ′ +74 21	h m 0 57	° ′ + 7 16
	s	″	s	″	s	″	s	″
(Dec.30.3)	3.31 −.29	56.5 −0.2	51.68 −.14	55.8 −0.6	9.94 −.72	69.7 +0.3	1.65 −.12	31.9 −0.7
Jan. 9.2	3.02 .30	56.0 0.7	51.54 .13	56.3 0.4	9.22 .72	69.6 −0.4	1.52 .13	31.1 0.8
19.2	2.72 .29	55.1 1.2	51.41 .13	56.6 −0.2	8.50 .70	68.9 1.0	1.39 .13	30.4 0.8
29.2	2.44 .27	53.6 1.7	51.29 .12	56.7 +0.1	7.81 .66	67.6 1.5	1.27 .12	29.6 0.7
Feb. 8.1	2.18 .24	51.8 2.0	51.17 .10	56.4 0.3	7.18 .59	65.8 2.0	1.15 .11	28.9 0.7
18.1	1.96 −.20	49.6 −2.2	51.08 −.08	55.9 +0.7	6.63 −.49	63.6 −2.4	1.04 −.10	28.2 −0.6
28.1	1.79 .14	47.3 2.5	51.01 .06	55.1 0.9	6.20 .37	61.0 2.7	0.95 .07	27.7 0.5
Mar. 10.1	1.67 .08	44.6 2.6	50.96 −.03	54.1 1.2	5.89 .24	58.1 2.9	0.89 .04	27.3 0.3
20.0	1.63 −.01	42.0 2.6	50.95 +.01	52.8 1.4	5.72 −.09	55.1 3.0	0.87 −.01	27.1 −0.1
30.0	1.65 +.06	39.5 2.4	50.98 .05	51.2 1.7	5.71 +.07	52.0 3.0	0.87 +.03	27.1 +0.1
Apr. 9.0	1.75 +.14	37.1 −2.2	51.04 +.09	49.5 +1.9	5.86 +.22	49.1 −2.8	0.92 +.07	27.3 +0.3
19.0	1.93 .21	35.0 1.9	51.15 .13	47.5 2.0	6.15 .36	46.4 2.6	1.02 .11	27.8 0.6
28.9	2.17 .28	33.3 1.5	51.30 .17	45.4 2.2	6.58 .50	44.0 2.2	1.15 .16	28.5 0.9
May 8.9	2.48 .34	32.0 1.1	51.49 .21	43.2 2.3	7.14 .62	42.0 1.8	1.33 .20	29.5 1.1
18.9	2.85 .39	31.1 0.6	51.72 .25	40.8 2.3	7.81 .71	40.5 1.3	1.54 .23	30.7 1.4
28.9	3.26 +.43	30.8 −0.1	51.98 +.27	38.5 +2.3	8.57 +.79	39.4 −0.8	1.79 +.26	32.2 +1.6
June 7.8	3.70 .45	30.9 +0.4	52.27 .30	36.2 2.3	9.39 .84	38.9 −0.2	2.07 .28	33.8 1.7
17.8	4.16 .47	31.5 0.9	52.57 .31	34.0 2.1	10.26 .87	39.0 +0.3	2.36 .30	35.6 1.8
27.8	4.64 .47	32.6 1.3	52.89 .32	32.0 1.9	11.13 .87	39.6 0.9	2.66 .31	37.5 1.9
July 7.7	5.10 .46	34.2 1.8	53.20 .31	30.1 1.7	12.00 .85	40.8 1.4	2.97 .30	39.4 1.9
17.7	5.55 +.44	36.1 +2.1	53.51 +.30	28.5 +1.4	12.84 +.81	42.4 +1.9	3.27 +.29	41.4 +1.9
27.7	5.98 .40	38.4 2.5	53.81 .28	27.2 1.1	13.63 .76	44.5 2.4	3.56 .28	43.2 1.8
Aug. 6.7	6.36 .36	41.0 2.7	54.08 .26	26.3 0.8	14.35 .68	47.0 2.7	3.83 .26	45.0 1.7
16.6	6.70 .32	43.9 2.9	54.32 .23	25.7 0.4	14.99 .59	49.9 3.0	4.07 .23	46.6 1.5
26.6	6.99 .26	46.9 3.1	54.54 .19	25.4 +0.1	15.54 .49	53.0 3.3	4.29 .20	48.1 1.3
Sept. 5.6	7.23 +.21	50.1 +3.2	54.71 +.15	25.5 −0.3	15.98 +.39	56.4 +3.5	4.47 +.16	49.3 +1.1
15.5	7.41 .15	53.3 3.2	54.84 .12	25.9 0.6	16.31 .27	60.0 3.6	4.62 .13	50.3 0.9
25.5	7.53 .09	56.4 3.1	54.94 .08	26.7 0.9	16.52 .16	63.6 3.6	4.73 .10	51.1 0.7
Oct. 5.5	7.60 +.04	59.6 3.0	55.00 .04	27.6 1.1	16.63 +.04	67.2 3.6	4.81 .06	51.7 0.4
15.5	7.60 −.02	62.5 2.9	55.02 +.01	28.8 1.3	16.61 −.08	70.8 3.5	4.85 +.03	52.0 +0.2
25.4	7.56 −.07	65.3 +2.6	55.01 −.03	30.2 −1.4	16.48 −.19	74.2 +3.3	4.87 .00	52.1 0.0
Nov. 4.4	7.46 .12	67.8 2.3	54.97 .05	31.6 1.4	16.23 .30	77.3 3.0	4.86 −.02	52.1 −0.1
14.4	7.32 .16	69.9 2.0	54.90 .08	32.9 1.4	15.87 .41	80.2 2.7	4.82 .05	51.9 0.3
24.3	7.14 .20	71.7 1.6	54.81 .10	34.3 1.3	15.41 .50	82.7 2.2	4.76 .07	51.6 0.4
Dec. 4.3	6.92 .24	73.0 1.1	54.71 .11	35.5 1.2	14.86 .59	84.7 1.8	4.68 .09	51.1 0.5
14.3	6.66 −.27	73.9 +0.6	54.59 −.12	36.6 −1.0	14.24 −.65	86.2 +1.2	4.59 −.10	50.5 −0.6
24.3	6.39 .28	74.3 +0.1	54.46 .13	37.5 0.8	13.56 .70	87.2 +0.6	4.48 .11	49.9 0.7
34.2	6.10 −.29	74.2 −0.4	54.33 −.13	38.2 −0.6	12.84 −.73	87.5 0.0	4.36 −.12	49.2 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Andromedæ.		θ^1 Ceti.		38 Cassiopeæ.		η Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	1h 3m	+35° 0′	1h 18m	− 8° 46′	1h 22m	+69° 40′	1h 25m	+14° 45′
	s	″	s	″	s	″	s	″
(Dec.30.3)	21.51 −.16	63.9 −0.3	19.50 −.12	27.5 −0.8	47.63 −.50	52.3 +0.8	23.31 −.12	27.4 −0.5
Jan. 9.3	21.34 .17	63.4 0.6	19.38 .13	28.2 0.7	47.12 .53	52.8 +0.2	23.18 .13	26.7 0.7
19.2	21.16 .18	62.6 0.9	19.24 .13	28.8 0.5	46.58 .54	52.6 −0.5	23.04 .14	26.0 0.8
29.2	20.99 .17	61.5 1.2	19.11 .13	29.3 0.3	46.04 .53	51.9 1.0	22.90 .14	25.2 0.8
Feb. 8.2	20.82 .16	60.1 1.4	18.98 .13	29.5 −0.1	45.52 .50	50.6 1.5	22.76 .13	24.4 0.8
18.1	20.67 −.14	58.6 −1.6	18.86 −.11	29.5 +0.1	45.04 −.45	48.8 −2.0	22.63 −.12	23.6 −0.8
28.1	20.55 .11	56.9 1.7	18.76 .09	29.3 0.3	44.62 .37	46.7 2.3	22.52 .10	22.8 0.8
Mar. 10.1	20.46 .07	55.2 1.7	18.68 .06	28.8 0.6	44.30 .28	44.2 2.6	22.43 .07	22.0 0.7
20.1	20.41 −.02	53.5 1.6	18.63 −.03	28.2 0.8	44.07 .17	41.4 2.8	22.38 −.04	21.4 0.5
30.0	20.40 +.02	52.0 1.5	18.61 +.01	27.3 1.1	43.95 −.06	38.6 2.8	22.36 .00	21.0 0.4
Apr. 9.0	20.45 +.07	50.6 −1.3	18.64 +.05	26.1 +1.3	43.95 +.06	35.8 −2.8	22.38 +.05	20.7 −0.1
19.0	20.56 .13	49.4 1.0	18.70 .09	24.7 1.5	44.08 .18	33.0 2.6	22.45 .09	20.7 +0.1
29.0	20.71 .18	48.6 0.7	18 81 .13	23.1 1.7	44.32 .30	30.6 2.3	22.56 .14	21.0 0.4
May 8.9	20.91 .23	48.0 −0.3	18.97 .17	21.3 1.9	44.68 .41	28.4 2.0	22.72 .18	21.5 0.7
18.9	21.16 .27	47.9 0.0	19.16 .21	19.3 2.0	45.14 .50	26.6 1.6	22.92 .22	22.2 0.9
28.9	21.45 +.30	48.1 +0.4	19.39 +.24	17.3 +2.1	45.68 +.58	25.2 −1.1	23.15 +.25	23.3 +1.2
June 7.8	21.76 .33	48.7 0.8	19.65 .27	15.2 2.1	46.30 .64	24.4 0.6	23.42 .28	24.6 1.4
17.8	22.10 .35	49.7 1.1	19.93 .29	13.0 2.1	46.96 .68	24.0 −0.1	23.71 .30	26.1 1.6
27.8	22.46 .35	51.0 1.5	20.22 .30	10.9 2.0	47.66 .71	24.1 +0.4	24.01 .31	27.7 1.7
July 7.8	22.81 .35	52.6 1.7	20.53 .30	8.9 1.9	48.37 .71	24.8 0.9	24.32 .31	29.5 1.8
17.7	23.16 +.34	54.5 +2.0	20.83 +.30	7.1 +1.7	49.08 +.70	26.0 +1.4	24.63 +.31	31.4 +1.9
27.7	23.49 .32	56.5 2.1	21.13 .29	5.5 1.5	49.77 .67	27.6 1.8	24.93 .29	33.2 1.9
Aug. 6.7	23.80 .30	58.8 2.3	21.41 .27	4.1 1.2	50.42 .63	29.6 2.2	25.22 .28	35.1 1.8
16.6	24.08 .27	61.1 2.4	21.66 .24	3.0 0.9	51.03 .58	32.0 2.6	25.48 .25	36.9 1.7
26.6	24.33 .23	63.5 2.4	21.90 .22	2.2 0.6	51.58 .51	34.7 2.9	25.72 .22	38.5 1.6
Sept. 5.6	24.55 +.20	65.8 +2.4	22.10 +.18	1.7 +0.3	52.05 +.44	37.7 +3.1	25.93 +.19	40.1 +1.4
15.6	24.72 .16	68.2 2.3	22.26 .15	1.6 0.0	52.45 .36	40.9 3.3	26.11 .16	41.4 1.3
25.5	24.86 .12	70.4 2.2	22.40 .12	1.7 −0.3	52.76 .27	44.3 3.4	26.25 .13	42.6 1.1
Oct. 5.5	24.96 .08	72.6 2.0	22.49 .08	2.1 0.5	52.99 .18	47.7 3.4	26.36 .09	43.6 0.9
15.5	25.02 +.04	74.5 1.9	22.56 .05	2.8 0.8	53.13 +.09	51.1 3.4	26.44 .06	44.3 0.7
25.5	25.04 .00	76.3 +1.7	22.59 +.02	3.6 -0.9	53.18 .00	54.5 +3.3	26.48 +.03	44.9 +0.5
Nov. 4.4	25.03 −.03	77.8 1.4	22.59 −.01	4.6 1.0	53.14 −.09	57.6 3.1	26.50 .00	45.3 0.3
14.4	24.98 .06	79.2 1.2	22.57 .04	5.7 1.1	53.00 .18	60.6 2.8	26.49 −.02	45.5 +0.1
24.4	24.91 .09	80.2 0.9	22.52 .06	6.8 1.1	52.78 .26	63.3 2 5	26.46 .05	45.5 0.0
Dec. 4.3	24.81 .11	80.9 0.6	22.45 .08	8.0 1.1	52.48 .34	65.6 2.1	26.39 .07	45.4 −0.2
14.3	24.68 −.14	81.3 +0.2	22.36 −.10	9.0 −1.0	52.09 −.41	67.4 +1.6	26.31 −.09	45.1 −0.3
24.3	24.54 .15	81.3 −0.1	22.25 .11	10.0 0.9	51.65 .47	68.8 1.1	26.21 .11	44.7 0.5
34.3	24.38 −.17	81.1 −0.4	22.13 −.12	10.8 −0.8	51.16 −.51	69.6 +0.5	26.09 −.12	44.2 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Eridani. (*Achernar.*)		*o* Piscium.		β Arietis.		50 Cassiopeæ.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 1 33	° ′ −57 48	h m 1 39	° ′ + 8 34	h m 1 48	° ′ +20 14	h m 1 53	° ′ +71 51
	s	″	s	″	s	″	s	″
Dec. 30.3	27.34 −.33	80.5 −0.7	22.75 −.11	56.9 −0.7	21.07 −.12	61.2 −0.4	45.74 −.54	80.6 +1.1
Jan. 9.3	27.01 .33	81.0 −0.2	22.63 .13	56.3 0.7	20.94 .14	60.8 0.5	45.19 .58	81.4 +0.6
19.2	26.68 .34	80.9 +0.4	22.49 .14	55.6 0.7	20.79 .15	60.2 0.7	44.59 .61	81.8 0.0
29.2	26.34 .33	80.2 0.9	22.35 .14	54.9 0.7	20.64 .15	59.4 0.8	43.97 .62	81.5 −0.6
Feb. 8.2	26.02 .31	79.0 1.5	22.21 .14	54.2 0.6	20.49 .15	58.6 0.9	43.35 .60	80.6 1.1
18.1	25.73 −.28	77.3 +1.9	22.08 −.13	53.6 −0.6	20.34 −.14	57.7 −0.9	42.77 −.56	79.2 −1.6
28.1	25.47 .24	75.2 2.4	21.96 .11	53.1 0.5	20 21 .12	56.8 0.9	42.24 .49	77.4 2.1
Mar. 10.1	25.25 .19	72.6 2.7	21.87 .08	52.7 0.3	20.10 .10	55.8 0.9	41.80 .39	75.1 2.4
20.1	25.08 .14	69.8 3.0	21.80 .05	52.4 −0.2	20.02 .06	55.0 0.8	41.45 .28	72.6 2.6
30.0	24.98 .08	66.6 3.3	21.77 −.01	52.3 0.0	19.97 −.02	54.2 0.7	41.23 .16	69.8 2.8
Apr. 9.0	24.93 −.01	63.2 +3.4	21.78 +.03	52.4 +0.2	19.97 +.02	53.7 −0.5	41.14 −.03	67.0 −2.8
19.0	24.96 +.06	59.7 3.5	21.83 .07	52.8 0.5	20.02 .07	53.3 −0.2	41.18 +.11	64.2 2.7
29.0	25.06 .13	56.2 3.6	21.92 .12	53.4 0.7	20.11 .12	53.2 0.0	41.35 .24	61.6 2.5
May 8.9	25.22 .20	52.6 3.5	22.06 .16	54.2 1.0	20.25 .16	53.3 +0.3	41.66 .37	59.1 2.3
18.9	25.46 .27	49.2 3.3	22.25 .20	55.3 1.2	20.44 .20	53.7 0.5	42.09 .48	57.0 1.9
28.9	25.76 +.33	45.9 +3.1	22.47 +.24	56.6 +1.4	20.66 +.24	54.4 +0.8	42.63 +.58	55.3 −1.5
June 7.8	26.11 .38	42.9 2.8	22.72 .26	58.1 1.6	20.92 .27	55.4 1.1	43.25 .66	54.0 1.0
17.8	26.51 .42	40.2 2.5	23.00 .29	59.7 1.7	21.20 .30	56.5 1.3	43.96 .73	53.2 0.6
27.8	26.95 .45	38.0 2.1	23.29 .30	61.4 1.8	21.51 .31	57.9 1.5	44.71 .77	52.9 −0.1
July 7.8	27.41 .47	36.1 1.6	23.59 .30	63.3 1.8	21.83 .32	59.5 1.6	45.49 .79	53.1 +0.4
17.7	27.89 +.48	34.8 +1.0	23.90 +.30	65.1 +1.8	22.15 +.32	61.2 +1.7	46.28 +.79	53.8 +0.9
27.7	28.36 .47	34.0 +0.5	24.20 .29	66.9 1.8	22.46 .31	63.0 1.8	47.07 .78	55.0 1.4
Aug. 6.7	28.83 .45	33.8 −0.1	24.48 .28	68.6 1.7	22.76 .29	64.8 1.8	47.83 .74	56.6 1.8
16.7	29.26 .41	34.2 0.6	24.75 .26	70.2 1.5	23.04 .27	66.6 1.8	48.56 .70	58.6 2.2
26.6	29.65 .37	35.1 1.2	25.00 .23	71.7 1.3	23.30 .25	68.4 1.7	49.22 .63	61.0 2.6
Sept. 5.6	30.00 +.32	36.6 −1.7	25.21 +.20	72.9 +1.1	23.54 +.22	70.0 +1.6	49.82 +.56	63.7 +2.8
15.6	30.29 .26	38.5 2.1	25.40 .17	74.0 0.9	23.74 .19	71.6 1.5	50.35 .49	66.7 3.1
25.5	30.51 .19	40.9 2.5	25.55 .14	74.8 0.7	23.91 .15	73.0 1.3	50.80 .40	69.9 3.2
Oct. 5.5	30.67 .12	43.5 2.8	25.67 .11	75.4 0.5	24.05 .12	74.2 1.1	51.15 .36	73.2 3.3
15.5	30.75 +.05	46.4 3.0	25.76 .08	75.8 0.3	24.15 .09	75.3 1.0	51.41 .21	76.6 3.4
25.5	30.76 −.02	49.5 −3.0	25.82 +.05	75.9 +0.1	24.22 +.06	76.1 +0.8	51.56 +.10	79.9 +3.4
Nov. 4.4	30.71 .09	52.3 2.9	25.85 +.02	75.9 −0.1	24.27 +.03	76.8 0.6	51.61 .00	83.3 3.2
14.4	30.60 .15	55.2 2.7	25.86 −.01	75.8 0.2	24.28 .00	77.4 0.4	51.56 −.11	86.4 3.0
24.4	30.42 .20	57.8 2.4	25.83 .04	75.5 0.4	24.26 −.03	77.7 0.3	51.39 .21	89.4 2.8
Dec. 4.4	30.20 .24	60.0 2.1	25.78 .06	75.1 0.5	24.22 .06	77.9 +0.1	51.13 .31	92.0 2.4
14.3	29.93 −.28	61.8 −1.6	25.71 −.08	74.6 −0.5	24.15 −.08	77.9 −0.1	50.77 −.41	94.2 +2.0
24.3	29.64 .31	63.2 1.1	25.62 .10	74.0 0.6	24.05 .11	77.7 0.3	50.32 .49	96.0 1.5
34.3	29.32 −.34	64.0 −0.6	25.51 −.12	73.4 −0.6	23.94 −.13	77.4 −0.4	49.80 −.55	97.2 +1.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Arietis.		*ξ*¹ Ceti.		*ι* Cassiopeæ.		*ξ*² Ceti.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 2 0	° ′ +22 55	h m 2 6	° ′ + 8 18	h m 2 19	° ′ +66 53	h m 2 22	° ′ + 7 56
	s	″	s	″	s	″	s	″
(Dec. 30.3	45.46 −.12	22.7 −0.3	57.94 −.10	36.5 −0.6	43.21 −.37	30.3 +1.3	6.42 −.09	49.2 −0.7
Jan. 9.3	45.33 .14	22.3 0.4	57.82 .12	35.8 0.6	42.82 .42	31.4 0.8	6.31 .12	48.6 0.6
19.2	45.18 .15	21.8 0.6	57.69 .14	35.2 0.6	42.38 .46	31.9 +0.3	6.19 .14	48.0 0.6
29.2	45.03 .16	21.1 0.7	·57.55 .15	34.6 0.6	41.91 .48	31.9 −0.3	6.04 .15	47.3 0.6
Feb. 8.2	44.87 .16	20.3 0.9	57.40 .15	34.0 0.6	41.43 .48	31.3 0.8	5.89 .15	46.8 0.5
18.2	44.71 −.15	19.4 −0.9	57.25 −.14	33.4 −0.5	40.96 −.45	30.2 −1.3	5.74 −.15	46.2 −0.5
28.2	44.56 .13	18.4 1.0	57.12 .13	32.9 0.4	40.52 .41	28.7 1.8	5.60 .13	45.8 0.4
Mar. 10.1	44.44 .11	17.4 1.0	57.00 .11	32.6 0.3	40.14 .35	26.7 2.1	5.47 .12	45.4 0.3
20.1	44.35 .08	16.5 0.9	56.91 .08	32.3 −0.2	39.82 .27	24.4 2.4	5.36 .09	45.2 −0.1
30.1	44.29 −.04	15.6 0.8	56.85 −.04	32.2 0.0	39.60 .17	21.9 2.6	5.29 .05	45.2 0.0
Apr. 9.1	44.28 +.01	14.9 −0.6	56.83 .00	32.4 +0.2	39.48 −.07	19.3 −2.6	5.26 −.01	45.3 +0.2
19.0	44.31 .06	14.4 0.4	56.86 +.05	32.7 0.4	39.46 +.04	16.7 2.6	5.27 +.03	45.7 0.5
29.0	44.39 .11	14.1 −0.2	56.92 .09	33.3 0.7	39.55 .15	14.2 2.4	5.32 .08	46.2 0.7
May 9.0	44.52 .15	14.0 +0.1	57.04 .14	34.1 0.9	39.76 .25	11.8 2.2	5.42 .12	47.0 0.9
18.9	44.70 .20	14.2 0.3	57.20 .18	35.1 1.1	40.06 .35	9.8 1.9	5.57 .17	48.0 1.1
28.9	44.92 +.24	14.7 +0.6	57.40 +.22	36.3 +1.3	40.46 +.44	8.0 −1.5	5.75 +.20	49.2 +1.3
June 7.9	45.18 .27	15.5 0.9	57.63 .25	37.7 1.5	40.93 .51	6.7 1.1	5.98 .24	50.6 1.5
17.9	45.46 .30	16.5 1.1	57.89 .27	39.3 1.6	41.47 .57	5.8 0.7	6.23 .27	52.2 1.6
27.8	45.77 .31	17.8 1.4	58.18 .29	41.0 1.7	42.07 .61	5.3 −0.2	6.51 .28	53.8 1.7
July 7.8	46.08 .32	19.2 1.5	58.47 .30	42.7 1.8	42.70 .64	5.3 +0.2	6.80 .30	55.5 1.7
17.8	46.41 +.32	20.8 +1.6	58.78 +.30	44.5 +1.8	43.35 +.65	5.7 +0.7	7.10 +.30	57.2 +1.7
27.7	46.73 .32	22.5 1.7	59.08 .30	46.2 1.7	44.00 .65	6.6 1.1	7.40 .30	58.9 1.7
Aug. 6.7	47.04 .30	24.2 1.8	59.37 .29	47.9 1.6	44.64 .63	8.0 1.5	7.70 .29	60.6 1.6
16.7	47.33 .28	26.0 1.8	59.65 .27	49.4 1.4	45.26 .60	9.7 1.9	7.98 .28	62.0 1.4
26.7	47.60 .26	27.8 1.8	59.91 .25	50.8 1.3	45.84 .56	11.8 2.2	8.25 .26	63.4 1.2
Sept. 5.6	47.85 +.23	29.5 +1.7	60.14 +.22	52.0 +1.1	46.38 +.51	14.2 +2.5	8.49 +.23	64.5 +1.0
15.6	48.06 .20	31.1 1.5	60.35 .19	53.0 0.9	46.86 .45	16.8 2.8	8.71 .21	65.4 0.8
25.6	48.25 .17	32.6 1.4	60.53 .16	53.7 0.6	47.28 .39	19.7 3.0	8.90 .18	66.2 0.6
Oct. 5.6	48.40 .14	33.9 1.3	60.68 .13	54.2 0.4	47.64 .32	22.8 3.1	9.06 .15	66.6 0.4
15.5	48.52 .10	35.1 1.1	60.80 .10	54.5 +0.2	47.92 .24	25.9 3.1	9.20 .12	66.9 +0.2
25.5	48.61 +.07	36.1 +0.9	60.88 +.07	54.7 0.0	48.13 +.16	29.0 +3.1	9.30 +.09	67.0 0.0
Nov. 4.5	48.67 .04	37.0 0.7	60.94 .04	54.6 −0.1	48.25 +.06	32.1 3.1	9.37 .06	66.9 −0.2
14.4	48.69 +.01	37.6 0.6	60.97 +.01	54.4 0.3	48.29 .00	35.2 2.9	9.42 +.03	66.7 0.3
24.4	48.69 −.02	38.2 0.4	60.97 −.01	54.1 0.4	48.24 −.09	38.0 2.7	9.43 .00	66.3 0.4
Dec. 4.4	48.65 .05	38.5 0.2	60.94 .04	53.7 0.5	48.11 .17	40.6 2.4	9.42 −.03	65.8 0.5
14.4	48.59 −.08	38.6 +0.1	60.89 −.07	53.2 −0.5	47.90 −.25	42.8 +2.1	9.37 −.06	65.3 −0.6
24.3	48.50 .10	38.6 −0.1	60.81 .09	52.6 0.6	47.61 .32	44.7 1.6	9.30 .08	64.7 0.6
34.3	48.38 −.12	38.4 −0.3	60.71 −.11	52.0 −0.6	47.25 −.39	46.0 +1.1	9.21 −.10	64.1 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Ceti.		α Ceti.		48 Cephei (H.)		ζ Arietis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 2 37	+ 2° 45′	h m 2 56	+ 3° 38′	h m 3 5	+77° 18′	h m 3 8	+20° 37′
	s	″	s	″	s	″	s	″
Dec. 30.3	24.16 -.09	9.7 -0.8	19.87 -.08	22.8 -0.8	58.45 -.58	58.7 +2.1	21.84 -.08	12.9 -0.1
Jan. 9.3	24.06 .12	8.9 0.7	19.77 .11	22.0 0.7	57.80 .72	60.6 1.6	21.74 .11	12.7 0.2
19.3	23.93 .13	8.2 0.7	19.65 .13	21.4 0.7	57.02 .82	61.9 1.1	21.62 .14	12.4 0.3
29.3	23.79 .15	7.6 0.6	19.51 .15	20.7 0.6	56.16 .89	62.7 +0.5	21.47 .16	12.1 0.4
Feb. 8.2	23.64 .15	7.1 0.5	19.36 .16	20.2 0.5	55.25 .92	63.0 -0.1	21.30 .17	11.6 0.5
18.2	23.48 -.15	6.7 -0.3	19.19 -.16	19.8 -0.4	54.33 -.91	62.5 -0.7	21.13 -.17	11.0 -0.6
28.2	23.33 .14	6.4 0.2	19.04 .15	19.5 0.2	53.43 .86	61.6 1.2	20.95 .17	10.4 0.6
Mar. 10.2	23.20 .13	6.3 -0.1	18.89 .14	19.3 -0.1	52.60 .78	60.1 1.7	20.79 .15	9.8 0.6
20.1	23.08 .10	6.3 +0.1	18.76 .11	19.3 +0.1	51.87 .66	58.2 2.1	20.65 .13	9.2 0.6
30.1	22.99 .07	6.5 0.3	18.66 .08	19.5 0.3	51.28 .51	55.8 2.5	20.53 .10	8.6 0.5
Apr. 9.1	22.95 -.03	6.9 +0.5	18.60 -.05	19.8 +0.5	50.85 -.34	53.2 -2.7	20.46 -.06	8.1 -0.5
19.0	22.94 +.02	7.6 0.7	18.57 .00	20.4 0.7	50.59 -.16	50.5 2.8	20.42 -.01	7.7 0.3
29.0	22.98 .06	8.4 0.9	18.59 +.04	21.2 0.9	50.52 +.03	47.6 2.8	20.44 +.04	7.4 -0.2
May 9.0	23.06 .11	9.4 1.2	18.66 .09	22.1 1.1	50.65 .22	44.8 2.7	20.50 .09	7.4 0.0
19.0	23.19 .15	10.7 1.4	18.76 .13	23.3 1.3	50.96 .40	42.2 2.5	20.61 .13	7.5 +0.2
28.9	23.36 +.19	12.2 +1.5	18.92 +.17	24.7 +1.4	51.44 +.57	39.8 -2.3	20.76 +.18	7.9 +0.5
June 7.9	23.56 .22	13.8 1.6	19.11 .21	26.2 1.6	52.09 .72	37.6 2.0	20.96 .22	8.4 0.7
17.9	23.80 .25	15.4 1.7	19.34 .24	27.8 1.7	52.88 .85	35.8 1.6	21.20 .25	9.2 0.9
27.8	24.07 .27	17.2 1.8	19.59 .27	29.5 1.7	53.78 .95	34.5 1.1	21.47 .28	10.2 1.0
July 7.8	24.35 .29	19.0 1.8	19.87 .28	31.2 1.7	54.78 1.03	33.6 0.7	21.76 .30	11.3 1.2
17.8	24.64 +.30	20.8 +1.7	20.16 +.29	32.9 +1.7	55.84 1.09	33.2 -0.2	22.06 +.31	12.5 +1.3
27.8	24.94 .30	22.5 1.6	20.46 .30	34.6 1.6	56.95 1.12	33.2 +0.3	22.38 .31	13.8 1.4
Aug. 6.7	25.24 .29	24.1 1.5	20.75 .29	36.1 1.5	58.08 1.12	33.7 0.7	22.69 .31	15.2 1.4
16.7	25.52 .28	25.5 1.3	21.04 .28	37.5 1.3	59.20 1.11	34.7 1.2	23.00 .31	16.6 1.4
26.7	25.79 .26	26.6 1.1	21.32 .27	38.7 1.1	60.29 1.07	36.1 1.6	23.30 .29	18.0 1.3
Sept. 5.7	26.04 +.24	27.6 +0.8	21.58 +.25	39.7 +0.8	61.34 1.01	37.9 +2.0	23.58 +.27	19.3 +1.2
15.6	26.26 .21	28.3 0.6	21.81 .23	40.4 0.6	62.31 .94	40.1 2.4	23.84 .25	20.4 1.1
25.6	26.47 .19	28.7 +0.3	22.03 .20	40.8 0.3	63.20 .84	42.6 2.7	24.08 .23	21.6 1.0
Oct. 5.6	26.64 .16	28.9 0.0	22.22 .18	41.0 +0.1	64.00 .73	45.4 2.9	24.29 .20	22.5 0.9
15.5	26.78 .13	28.8 -0.2	22.38 .15	41.0 -0.1	64.67 .61	48.5 3.1	24.48 .17	23.4 0.8
25.5	26.90 +.10	28.6 -0.4	22.52 +.12	40.7 -0.3	65.22 +.47	51.7 +3.3	24.64 +.15	24.0 +0.6
Nov. 4.5	26.99 .07	28.1 0.5	22.62 .09	40.3 0.5	65.61 .32	55.0 3.3	24.77 .11	24.6 0.5
14.5	27.04 .04	27.5 0.6	22.70 .06	39.7 0.6	65.86 +.16	58.3 3.3	24.87 .08	25.1 0.4
24.4	27.07 +.01	26.8 0.7	22.74 +.03	39.1 0.7	65.93 -.01	61.6 3.2	24.93 .05	25.4 0.3
Dec. 4.4	27.07 -.02	26.1 0.8	22.76 .00	38.3 0.8	65.84 .18	64.8 3.0	24.96 +.01	25.7 0.2
14.4	27.03 -.05	25.3 -0.8	22.74 -.03	37.5 -0.8	65.58 -.34	67.7 +2.8	24.96 -.02	25.8 +0.1
24.4	26.97 .07	24.5 0.8	22.69 .06	36.7 0.8	65.16 .50	70.3 2.4	24.92 .06	25.8 0.0
34.3	26.88 -.10	23.8 -0.7	22.61 -.09	36.0 -0.7	64.58 -.64	72.5 +1.9	24.85 -.09	25.7 -0.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Persei.		ε Eridani.		δ Persei.		η Tauri.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 3 16	° ′ +49 27	h m 3 27	° ′ − 9 50	h m 3 34	° ′ +47 25	h m 3 40	° ′ +23 44
	s	″	s	″	s	″	s	″
(Dec.30.4)	12.85 −.13	18.8 +1.1	34.28 −.08	52.8 −1.3	50.26 −.10	20.2 +1.2	43.53 −.05	62.0 +0.1
Jan. 9.3	12.70 .18	19.8 0.8	34.19 .10	54.0 1.1	50.13 .15	21.2 0.9	43.46 .09	62.0 0.0
19.3	12.50 .22	20.5 0.5	34.07 .13	55.0 0.9	49.96 .19	22.0 0.6	43.34 .13	62.0 −0.1
29.3	12.26 .25	20.8 +0.1	33.93 .15	55.8 0.7	49.74 .23	22.4 +0.2	43.20 .16	61.8 0.2
Feb. 8.2	12.00 .27	20.7 −0.3	33.77 .17	56.4 0.4	49.50 .25	22.4 −0.1	43.03 .17	61.5 0.3
18.2	11.73 −.27	20.2 −0.7	33.59 −.17	56.7 −0.2	49.24 −.26	22.1 −0.5	42.85 −.18	61.1 −0.4
28.2	11.45 .27	19.3 1.0	33.42 .17	56.8 +0.1	48.97 .26	21.4 0.8	42.67 .19	60.6 0.5
Mar. 10.2	11.20 .24	18.2 1.3	33.25 .16	56.6 0.3	48.72 .24	20.5 1.1	42.48 .17	60.1 0.6
20.1	10.97 .21	16.7 1.5	33.09 .14	56.1 0.6	48.49 .21	19.3 1.3	42.32 .15	59.5 0.6
30.1	10.79 .16	15.1 1.7	32.96 .12	55.4 0.8	48.29 .17	17.8 1.5	42.18 .12	58.8 0.6
Apr. 9.1	10.65 −.10	13.3 −1.8	32.86 −.08	54.4 +1.1	48.15 −.12	16.2 −1.6	42.07 −.09	58.2 −0.6
19.1	10.58 −.04	11.5 1.8	32.80 −.04	53.2 1.3	48.06 −.06	14.6 1.6	42.01 −.05	57.7 0.5
29.0	10.58 +.03	9.7 1.7	32.78 .00	51.7 1.6	48.03 +.01	13.0 1.6	41.98 .00	57.3 0.4
May 9.0	10.64 .10	8.1 1.6	32.80 +.05	50.1 1.8	48.07 .07	11.4 1.5	42.02 +.06	57.0 −0.2
19.0	10.78 .17	6.6 1.4	32.88 .09	48.2 1.9	48.18 .14	9.9 1.4	42.10 .11	56.9 0.0
28.9	10.98 +.23	5.3 −1.2	32.99 +.14	46.2 +2.0	48.34 +.20	8.7 −1.2	42.22 +.15	57.0 +0.2
June 7.9	11.23 .28	4.2 0.9	33.15 .18	44.1 2.1	48.57 .26	7.6 0.9	42.40 .20	57.2 0.4
17.9	11.54 .33	3.5 0.6	33.35 .21	42.0 2.2	48.85 .30	6.9 0.6	42.62 .23	57.7 0.5
27.9	11.90 .37	3.1 −0.2	33.57 .24	39.8 2.1	49.18 .34	6.4 −0.3	42.86 .26	58.3 0.7
July 7.8	12.28 .40	3.0 +0.2	33.83 .26	37.7 2.1	49.54 .37	6.2 0.0	43.14 .29	59.1 0.9
17.8	12.69 +.42	3.3 +0.4	34.10 +.28	35.7 +1.9	49.93 +.40	6.4 +0.3	43.44 +.30	60.0 +1.0
27.8	13.11 .43	3.9 0.7	34.38 .29	33.9 1.7	50.33 .41	6.8 0.6	43.75 .31	61.1 1.1
Aug. 6.8	13.54 .43	4.8 1.0	34.67 .29	32.3 1.5	50.74 .41	7.5 0.8	44.07 .32	62.2 1.2
16.7	13.96 .42	6.0 1.3	34.96 .28	31.0 1.2	51.16 .41	8.5 1.1	44.38 .31	63.4 1.2
26.7	14.38 .40	7.4 1.5	35.24 .28	30.0 0.8	51.56 .40	9.7 1.3	44.70 .31	64.6 1.2
Sept. 5.7	14.77 +.38	9.0 +1.7	35.51 +.26	29.3 +0.5	51.95 +.38	11.0 +1.5	45.00 +.29	65.7 +1.1
15.6	15.14 .36	10.8 1.9	35.76 .24	29.0 +0.1	52.32 .36	12.6 1.6	45.28 .28	66.8 1.1
25.6	15.48 .33	12.7 2.0	36.00 .22	29.1 −0.3	52.67 .33	14.3 1.8	45.55 .26	67.8 1.0
Oct. 5.6	15.80 .29	14.8 2.1	36.21 .20	29.6 0.6	52.99 .30	16.2 1.9	45.79 .23	68.8 0.9
15.6	16.06 .24	16.9 2.1	36.39 .17	30.3 0.9	53.27 .27	18.0 1.9	46.02 .21	69.6 0.8
25.5	16.29 +.21	19.0 +2.2	36.55 +.14	31.4 −1.1	53.52 +.23	20.0 +2.0	46.21 +.18	70.3 +0.7
Nov. 4.5	16.48 .16	21.2 2.2	36.68 .11	32.6 1.3	53.73 .19	22.0 2.0	46.38 .15	71.0 0.6
14.5	16.62 .12	23.4 2.1	36.78 .08	34.0 1.5	53.89 .14	23.9 1.9	46.52 .12	71.6 0.5
24.5	16.70 .06	25.4 2.0	36.84 .05	35.5 1.5	54.01 .09	25.8 1.9	46.62 .08	72.0 0.4
Dec. 4.4	16.74 +.01	27.3 1.8	36.87 +.01	37.1 1.5	54.08 +.04	27.6 1.7	46.68 .05	72.4 0.3
14.4	16.72 −.05	29.0 +1.6	36.87 −.02	38.6 −1.5	54.09 −.02	29.3 +1.6	46.71 +.01	72.7 +0.3
24.4	16.65 .10	30.5 1.3	36.84 .05	40.0 1.4	54.04 .07	30.8 1.4	46.70 −.03	72.9 0.2
34.4	16.53 −.15	31.7 +1.0	36.77 −.09	41.3 −1.2	53.95 −.12	32.0 +1.1	46.66 −.07	73.0 +0.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Persei.		γ Eridani.		γ Tauri.		ε Tauri.	
	Right Ascension.	Declination *North*.	Right Ascension.	Declination *South*.	Right Ascension.	Declination *North*.	Right Ascension.	Declination *North*.
	h m 3 46	° ′ +31 32	h m 3 52	° ′ −13 49	h m 4 13	° ′ +15 20	h m 4 21	° ′ +18 55
	s	″	s	″	s	″	s	″
(Dec. 30.4)	59.22 −.06	35.8 +0.5	43.50 −.06	74.1 −1.6	19.42 −.03	57.9 −0.3	58.70 −.02	28.8 −0.1
Jan. 9.3	59.14 .10	36.2 0.3	43.42 .09	75.5 1.3	19.37 .07	57.6 0.3	58.66 .06	28.7 0.1
19.3	59.02 .14	36.4 +0.2	43.32 .12	76.7 1.1	19.28 .10	57.3 0.3	58.58 .10	28.6 0.2
29.3	58.86 .17	36.5 0.0	43.17 .15	77.7 0.8	19.16 .13	57.0 0.3	58.46 .13	28.4 0.2
Feb. 8.3	58.68 .19	36.4 −0.2	43.01 .17	78.4 0.5	19.02 .16	56.7 0.3	58.32 .16	28.2 0.2
18.2	58.49 −.20	36.0 −0.4	42.83 −.18	78.7 −0.3	18.85 −.18	56.3 −0.3	58.14 −.18	27.9 −0.3
28.2	58.28 .20	35.5 0.6	42.65 .18	78.9 0.0	18.67 .18	56.0 0.3	57.96 .19	27.6 0.3
Mar. 10.2	58.08 .19	34.9 0.7	42.46 .18	78.7 +0.3	18.48 .18	55.7 0.3	57.77 .18	27.3 0.3
20.2	57.90 .17	34.1 0.8	42.29 .16	78.2 0.6	18.31 .16	55.4 0.3	57.59 .17	27.0 0.3
30.1	57.74 .14	33.2 0.9	42.14 .14	77.5 0.9	18.16 .14	55.2 0.2	57.43 .15	26.7 0.3
Apr. 9.1	57.62 −.10	32.4 −0.9	42.02 −.10	76.4 +1.2	18.03 −.11	55.0 −0.1	57.30 −.12	26.4 −0.3
19.1	57.54 −.05	31.5 0.9	41.94 .06	75.1 1.5	17.94 .07	55.0 0.0	57.20 .08	26.2 0.2
29.1	57.52 .00	30.6 0.8	41.89 −.02	73.5 1.7	17.90 −.02	55.0 +0.1	57.15 −.03	26.0 −0.1
May 9.0	57.54 +.05	29.9 0.7	41.89 +.02	71.7 1.9	17.90 +.02	55.2 0.3	57.14 +.02	26.0 0.0
19.0	57.62 .11	29.3 0.5	41.94 .07	69.7 2.1	17.94 .07	55.5 0.4	57.18 .06	26.1 +0.1
29.0	57.75 +.16	28.9 −0.3	42.03 +.11	67.6 +2.2	18.03 +.11	56.0 +0.6	57.26 +.11	26.4 +0.3
June 7.9	57.93 .20	28.7 −0.1	42.17 .15	65.3 2.3	18.17 .16	56.6 0.7	57.39 .15	26.8 0.5
17.9	58.15 .24	28.7 +0.1	42.34 .19	63.0 2.3	18.35 .20	57.4 0.8	57.57 .19	27.3 0.6
27.9	58.42 .28	28.9 0.3	42.55 .22	60.7 2.3	18.56 .23	58.3 1.0	57.78 .23	28.0 0.7
July 7.9	58.71 .30	29.3 0.5	42.79 .25	58.5 2.2	18.80 .25	59.3 1.0	58.02 .25	28.8 0.8
17.8	59.02 +.32	29.9 +0.7	43.05 +.27	56.4 +2.0	19.07 +.27	60.4 +1.1	58.28 +.28	29.6 +0.9
27.8	59.35 .33	30.7 0.9	43.33 .28	54.5 1.8	19.35 .29	61.5 1.1	58.57 .29	30.6 1.0
Aug. 6.8	59.68 .34	31.6 1.0	43.62 .29	52.8 1.5	19.64 .30	62.6 1.1	58.87 .30	31.6 1.0
16.8	60.02 .34	32.6 1.1	43.91 .29	51.5 1.2	19.94 .30	63.7 1.0	59.17 .30	32.5 1.0
26.7	60.36 .33	33.8 1.1	44.19 .28	50.5 0.8	20.24 .30	64.7 0.9	59.47 .30	33.5 0.9
Sept. 5.7	60.68 +.32	34.9 +1.2	44.47 +.27	49.8 +0.4	20.54 +.29	65.6 +0.8	59.77 +.30	34.3 +0.8
15.7	60.98 .30	36.1 1.2	44.74 .26	49.6 0.0	20.82 .28	66.3 0.7	60.07 .29	35.1 0.7
25.6	61.28 .28	37.3 1.2	44.99 .24	49.8 −0.4	21.09 .26	67.0 0.5	60.35 .27	35.7 0.6
Oct. 5.6	61.54 .26	38.5 1.2	45.22 .22	50.4 0.8	21.35 .25	67.4 0.4	60.61 .26	36.2 0.5
15.6	61.79 .23	39.7 1.1	45.43 .19	51.3 1.1	21.58 .22	67.7 0.2	60.86 .24	36.6 0.4
25.6	62.00 +.20	40.8 +1.1	45.61 +.17	52.5 −1.4	21.80 +.20	67.9 +0.1	61.09 +.21	37.0 +0.3
Nov. 4.5	62.19 .17	41.8 1.0	45.76 .14	54.0 1.6	21.98 .18	67.9 0.0	61.29 .19	37.2 0.2
14.5	62.34 .13	42.9 1.0	45.89 .11	55.7 1.7	22.15 .15	67.8 −0.1	61.46 .16	37.3 +0.1
24.5	62.46 .10	43.8 0.9	45.98 .07	57.5 1.8	22.28 .11	67.7 0.2	61.60 .12	37.3 0.0
Dec. 4.5	62.54 .06	44.7 0.8	46.03 +.04	59.3 1.8	22.37 .08	67.5 0.2	61.71 .09	37.3 0.0
14.4	62.57 +.01	45.4 +0.7	46.05 .00	61.1 −1.8	22.43 +.04	67.3 −0.2	61.78 +.05	37.3 0.0
24.4	62.56 −.03	46.1 0.6	46.03 −.04	62.8 1.6	22.45 .00	67.0 0.3	61.81 +.01	37.2 −0.1
34.4	62.51 −.07	46.6 +0.4	45.98 −.07	64.4 −1.4	22.43 −.04	66.8 −0.3	61.80 −.03	37.2 −0.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Tauri. (*Aldebaran.*)		*α* Camelopardalis.		*ι* Aurigæ.		11 Orionis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 4 29	° ′ +16 16	h m 4 42	° ′ +66 8	h m 4 49	° ′ +32 58	h m 4 58	° ′ +15 14
	s	″	s	″	s	″	s	″
(Dec.30.4)	23.86 −.01	37.2 −0.2	46.25 −.08	49.0 +2.4	35.58 .00	58.3 +0.7	4.43 +.02	30.7 −0.3
Jan. 9.4	23.83 .05	37.0 0.3	46.12 .18	51.2 2.1	35.56 −.05	59.0 0.6	4.42 −.03	30.4 0.3
19.4	23.75 .09	36.7 0.3	45.89 .27	53.2 1.8	35.49 .09	59.6 0.5	4.36 .07	30.1 0.3
29.3	23.64 .13	36.5 0.3	45.57 .35	54.8 1.4	35.37 .14	60.0 0.4	4.27 .11	29.9 0.2
Feb. 8.3	23.50 .16	36.2 0.3	45.18 .42	56.0 1.0	35.21 .17	60.3 +0.2	4.14 .15	29.6 0.2
18.3	23.33 −.18	35.9 −0.3	44.73 −.46	56.7 +0.5	35.03 −.20	60.4 0.0	3.98 −.17	29.4 −0.2
28.2	23.15 .18	35.7 0.3	44.26 .48	57.0 0.0	34.82 .21	60.4 −0.1	3.80 .18	29.2 0.2
Mar. 10.2	22.96 .18	35.4 0.3	43.77 .48	56.7 −0.5	34.60 .21	60.1 0.3	3.62 .19	29.1 0.2
20.2	22.78 .17	35.2 0.2	43.30 .45	56.0 1.0	34.40 .21	59.8 0.5	3.43 .18	28.9 0.1
30.2	22.62 .15	34.9 0.2	42.87 .41	54.8 1.4	34.19 .19	59.2 0.6	3.26 .16	28.8 0.1
Apr. 9.1	22.48 −.12	34.7 −0.1	42.49 −.35	53.3 −1.7	34.02 −.15	58.6 −0.7	3.10 −.14	28.7 −0.1
19.1	22.38 .08	34.6 0.0	42.18 .26	51.4 2.0	33.89 .11	57.8 0.7	2.98 .10	28.7 0.0
29.1	22.32 −.04	34.6 +0.1	41.97 .16	49.3 2.2	33.80 .06	57.1 0.8	2.90 .06	28.8 +0.1
May 9.1	22.30 +.01	34.8 0.2	41.85 −.06	47.0 2.3	33.76 −.01	56.3 0.7	2.86 −.02	28.9 0.2
19.0	22.33 .05	35.0 0.3	41.84 +.04	44.7 2.3	33.77 +.04	55.6 0.7	2.86 +.03	29.2 0.3
29.0	22.41 +.10	35.4 +0.5	41.94 +.14	42.4 −2.3	33.84 +.09	55.0 −0.6	2.91 +.07	29.6 +0.5
June 8.0	22.53 .14	35.9 0.6	42.13 .24	40.2 2.1	33.96 .14	54.5 0.4	3.00 .12	30.1 0.6
17.9	22.70 .18	36.6 0.7	42.42 .33	38.1 2.0	34.12 .19	54.1 0.3	3.14 .16	30.7 0.7
27.9	22.90 .22	37.4 0.8	42.79 .42	36.3 1.7	34.33 .23	53.9 −0.1	3.32 .19	31.5 0.8
July 7.9	23.13 .25	38.2 0.9	43.25 .49	34.7 1.4	34.57 .26	53.8 0.0	3.52 .22	32.3 0.8
17.9	23.39 +.27	39.2 +1.0	43.76 +.54	33.4 −1.1	34.85 +.29	53.9 +0.2	3.76 +.25	33.1 +0.9
27.8	23.66 .28	40.2 1.0	44.33 .59	32.4 0.8	35.15 .31	54.1 0.3	4.02 .27	34.0 0.9
Aug. 6.8	23.95 .29	41.2 1.0	44.94 .62	31.8 0.4	35.47 .33	54.4 0.4	4.30 .28	34.9 0.9
16.8	24.25 .30	42.2 0.9	45.58 .65	31.6 −0.1	35.80 .33	54.9 0.5	4.58 .29	35.7 0.8
26.8	24.55 .30	43.0 0.9	46.24 .66	31.7 +0.3	36.14 .34	55.4 0.6	4.88 .29	36.5 0.7
Sept. 5.7	24.85 +.29	43.9 +0.8	46.90 +.66	32.1 +0.6	36.48 +.34	56.0 +0.6	5.17 +.29	37.2 +0.6
15.7	25.14 .28	44.6 0.6	47.55 .64	32.9 1.0	36.81 .33	56.7 0.7	5.46 .29	37.7 0.5
25.7	25.41 .27	45.1 0.5	48.19 .62	34.1 1.3	37.14 .32	57.4 0.7	5.75 .28	38.1 0.3
Oct. 5.6	25.68 .26	45.5 0.3	48.80 .59	35.5 1.6	37.46 .31	58.1 0.7	6.03 .27	38.3 +0.2
15.6	25.93 .24	45.8 0.2	49.37 .55	37.3 1.9	37.76 .29	58.9 0.7	6.29 .26	38.4 0.0
25.6	26.16 +.22	45.9 +0.1	49.90 +.50	39.2 +2.1	38.03 +.27	59.6 +0.8	6.54 +.24	38.4 −0.1
Nov. 4.6	26.36 .19	45.9 0.0	50.37 .43	41.5 2.3	38.29 .24	60.4 0.8	6.77 .22	38.2 0.2
14.5	26.54 .16	45.8 −0.1	50.77 .36	43.9 2.5	38.51 .21	61.2 0.8	6.97 .19	38.0 0.3
24.5	26.69 .13	45.7 0.2	51.09 .28	46.5 2.6	38.70 .17	62.0 0.8	7.15 .16	37.6 0.3
Dec. 4.5	26.80 .09	45.5 0.2	51.32 .18	49.1 2.6	38.86 .13	62.8 0.8	7.29 .12	37.3 0.3
14.5	26.88 +.05	45.3 −0.2	51.46 +.09	51.8 +2.6	38.96 +.08	63.5 +0.8	7.39 +.08	37.0 −0.3
24.4	26.91 +.01	45.1 0.2	51.50 −.02	54.4 2.5	39.02 +.04	64.3 0.8	7.45 +.04	36.6 0.3
34.4	26.90 −.03	44.8 −0.2	51.43 −.12	56.8 +2.3	39.04 −.01	65.0 +0.7	7.47 .00	36.3 −0.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α Aurigæ. (Capella.)* Right Ascension.	*α Aurigæ. (Capella.)* Declination *North.*	*β Orionis. (Rigel.)* Right Ascension.	*β Orionis. (Rigel.)* Declination *South.*	*β Tauri.* Right Ascension.	*β Tauri.* Declination *North.*	Groombridge 966. Right Ascension.	Groombridge 966. Declination *North.*
	h m 5 8	° ′ +45 52	h m 5 9	° ′ − 8 19	h m 5 19	° ′ +28 30	h m 5 24	° ′ +74 57
	s	″	s	″	s	″	s	″
(Dec. 30.4	17.82 +.02	45.3 +1.4	4.65 +.01	75.3 −1.6	6.46 +.03	28.2 +0.4	34.49 −.03	53.3 +2.9
Jan. 9.4	17.81 −.04	46.7 1.3	4.64 −.04	76.8 1.5	6.47 −.02	28.7 0.4	34.38 .19	56.0 2.7
19.4	17.73 .10	48.0 1.2	4.58 .08	78.2 1.3	6.43 .06	29.1 0.4	34.12 .35	58.6 2.4
29.4	17.60 .16	49.0 0.9	4.49 .12	79.4 1.0	6.34 .11	29.4 0.3	33.69 .49	60.9 2.1
Feb. 8.3	17.41 .20	49.8 0.7	4.36 .15	80.3 0.8	6.21 .15	29.7 0.2	33.14 .61	62.7 1.6
18.3	17.19 −.24	50.4 +0.4	4.19 −.17	81.0 −0.6	6.04 −.18	29.9 +0.1	32.48 −.70	64.2 +1.1
28.3	16.94 .26	50.6 +0.1	4.02 .19	81.4 −0.3	5.85 .20	30.0 0.0	31.74 .76	65.0 0.6
Mar. 10.2	16.67 .27	50.6 −0.2	3.82 .19	81.6 0.0	5.65 .21	29.9 −0.1	30.94 .78	65.4 +0.1
20.2	16.40 .26	50.2 0.5	3.64 .18	81.4 +0.2	5.44 .20	29.8 0.2	30.19 .77	65.2 −0.5
30.2	16.15 .24	49.6 0.8	3.45 .17	81.2 0.4	5.24 .19	29.5 0.3	29.44 .72	64.5 1.0
Apr. 9.2	15.93 −.20	48.7 −1.0	3.29 −.15	80.6 +0.7	5.07 −.16	29.1 −0.4	28.75 −.64	63.2 −1.4
19.1	15.75 .16	47.6 1.2	3.16 .12	79.8 1.0	4.92 .13	28.7 0.5	28.15 .54	61.6 1.8
29.1	15.62 .10	46.4 1.3	3.06 .08	78.7 1.2	4.81 .08	28.2 0.5	27.67 .41	59.6 2.2
May 9.1	15.54 −.05	45.1 1.4	3.00 −.04	77.4 1.4	4.75 −.04	27.7 0.5	27.33 .27	57.3 2.4
19.1	15.53 +.02	43.7 1.4	2.98 .00	75.9 1.6	4.73 +.01	27.3 0.4	27.14 −.12	54.8 2.6
29.0	15.58 +.08	42.4 −1.3	3.00 +.05	74.2 +1.7	4.77 +.06	26.9 −0.4	27.09 +.04	52.1 −2.6
June 8.0	15.68 .14	41.1 1.2	3.07 .09	72.5 1.8	4.85 .11	26.6 0.3	27.21 .19	49.5 2.6
18.0	15.85 .19	39.9 1.1	3.18 .13	70.6 1.9	4.98 .15	26.3 0.2	27.47 .34	46.9 2.5
27.9	16.07 .24	38.8 1.0	3.32 .16	68.6 2.0	5.15 .19	26.2 −0.1	27.88 .48	44.5 2.4
July 7.9	16.33 .29	38.0 0.8	3.50 .20	66.7 1.9	5.36 .23	26.2 0.0	28.42 .60	42.2 2.2
17.9	16.64 +.32	37.3 −0.6	3.71 +.22	64.8 +1.8	5.60 +.26	26.3 +0.1	29.08 +.71	40.2 −1.9
27.9	16.98 .35	36.8 0.4	3.95 .24	63.0 1.7	5.87 .28	26.5 0.2	29.84 .80	38.5 1.6
Aug. 6.8	17.34 .37	36.5 −0.2	4.20 .26	61.4 1.5	6.16 .30	26.8 0.3	30.69 .88	37.1 1.2
16.8	17.73 .39	36.4 0.0	4.47 .27	60.0 1.2	6.47 .31	27.1 0.3	31.60 .94	36.0 0.9
26.8	18.12 .40	36.5 +0.2	4.74 .28	58.9 0.9	6.79 .32	27.4 0.4	32.57 .98	35.4 0.5
Sept. 5.8	18.52 +.40	36.8 +0.4	5.02 +.28	58.1 +0.6	7.11 +.32	27.8 +0.4	33.56 1.00	35.1 −0.1
15.7	18.92 .40	37.3 0.5	5.30 .28	57.7 +0.2	7.43 .32	28.2 0.4	34.58 1.01	35.2 +0.3
25.7	19.32 .39	37.9 0.7	5.58 .27	57.6 −0.1	7.75 .32	28.6 0.4	35.59 1.00	35.8 0.7
Oct. 5.7	19.70 .38	38.7 0.9	5.85 .26	57.9 0.5	8.06 .31	29.0 0.4	36.58 .97	36.7 1.1
15.6	20.07 .36	39.6 1.0	6.10 .25	58.6 0.8	8.37 .30	29.3 0.3	37.53 .92	38.0 1.5
25.6	20.42 +.34	40.6 +1.1	6.34 +.23	59.6 −1.1	8.66 +.28	29.7 +0.3	38.43 +.86	39.7 +1.9
Nov. 4.6	20.74 .30	41.8 1.3	6.56 .21	60.9 1.4	8.92 .26	30.0 0.4	39.25 .77	41.7 2.2
14.6	21.03 .27	43.2 1.4	6.76 .18	62.4 1.6	9.17 .23	30.4 0.4	39.97 .67	44.1 2.5
24.5	21.28 .22	44.6 1.4	6.92 .15	64.0 1.7	9.38 .20	30.8 0.4	40.58 .54	46.6 2.7
Dec. 4.5	21.48 .17	46.0 1.5	7.06 .12	65.8 1.8	9.56 .16	31.2 0.4	41.06 .40	49.4 2.8
14.5	21.62 +.12	47.5 +1.5	7.15 +.08	67.6 −1.7	9.70 +.11	31.6 +0.4	41.38 +.25	52.4 +2.9
24.5	21.71 +.06	49.0 1.5	7.21 +.03	69.3 1.7	9.79 .07	32.0 0.4	41.55 +.08	55.3 2.9
34.4	21.74 −.01	50.5 +1.4	7.22 −.01	70.9 −1.5	9.84 +.02	32.5 +0.4	41.55 −.08	58.2 +2.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Orionis.		α Leporis.		ε Orionis.		α Columbæ.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 5 26	° ′ − 0 23	h m 5 27	° ′ −17 54	h m 5 30	° ′ − 1 16	h m 5 35	° ′ −34 7
	s	″	s	″	s	″	s	″
(Dec. 30.4	12.09 +.03	15.2 −1.2	43.33 +.02	29.7 −2.1	26.86 +.03	43.5 −1.3	32.74 .00	81.9 −2.9
Jan. 9.4	12.10 −.02	16.4 1.1	43.32 −.03	31.8 2.0	26.87 −.01	44.8 1.2	32.71 −.06	84.6 2.6
19.4	12.06 .06	17.5 1.0	43.27 .08	33.6 1.7	26.84 .06	45.9 1.0	32.63 .10	87.0 2.3
29.4	11.98 .10	18.4 0.8	43.17 .12	35.2 1.4	26.76 .10	46.9 0.8	32.50 .15	89.1 1.9
Feb. 8.3	11.86 .13	19.1 0.6	43.04 .15	36.5 1.1	26.65 .13	47.7 0.7	32.33 .19	90.8 1.5
18.3	11.72 −.16	19.7 −0.5	42.87 −.18	37.4 −0.8	26.50 −.16	48.3 −0.5	32.13 −.21	92.1 −1.1
28.3	11.55 .18	20.1 0.3	42.68 .20	38.1 0.5	26.33 .18	48.7 0.3	31.90 .24	93.0 0.6
Mar. 10.3	11.36 .18	20.3 −0.1	42.48 .20	38.4 −0.1	26.15 .19	48.9 −0.1	31.65 .25	93.4 −0.2
20.2	11.18 .18	20.3 +0.1	42.28 .20	38.3 +0.2	25.96 .18	48.9 +0.1	31.40 .25	93.3 +0.3
30.2	11.00 .17	20.1 0.3	42.08 .19	37.9 0.6	25.78 .17	48.7 0.3	31.16 .24	92.8 0.7
Apr. 9.2	10.83 −.15	19.8 +0.4	41.90 −.17	37.2 +0.9	25.62 −.15	48.3 +0.5	30.93 −.21	91.9 +1.1
19.1	10.69 .12	19.2 0.6	41.74 .14	36.1 1.2	25.47 .13	48.0 0.6	30.73 .18	90.6 1.5
29.1	10.59 .09	18.5 0.8	41.61 .11	34.8 1.5	25.36 .09	47.0 0.8	30.56 .15	88.8 1.9
May 9.1	10.52 .05	17.6 1.0	41.53 .07	33.2 1.6	25.29 .05	46.1 1.0	30.43 .11	86.8 2.2
19.1	10.49 −.01	16.6 1.1	41.48 −.02	31.5 1.9	25.26 −.01	45.0 1.2	30.35 .06	84.4 2.5
29.0	10.51 +.04	15.4 +1.3	41.48 +.02	29.4 +2.2	25.27 +.03	43.8 +1.3	30.31 −.01	81.8 +2.7
June 8.0	10.56 .08	14.1 1.4	41.52 .06	27.1 2.3	25.32 .07	42.4 1.4	30.33 +.04	79.0 2.9
18.0	10.66 .12	12.6 1.5	41.60 .10	24.8 2.3	25.42 .11	41.0 1.5	30.39 .08	76.1 2.9
28.0	10.80 .15	11.1 1.5	41.73 .14	22.5 2.3	25.55 .15	39.4 1.6	30.49 .13	73.2 2.9
July 7.9	10.97 .18	9.6 1.5	41.89 .18	20.2 2.3	25.72 .18	37.9 1.6	30.64 .17	70.3 2.9
17.9	11.17 +.21	8.1 +1.5	42.08 +.21	17.9 +2.2	25.92 +.21	36.3 +1.5	30.83 +.21	67.5 +2.7
27.9	11.40 .24	6.6 1.4	42.30 .23	15.8 2.0	26.14 .23	34.8 1.4	31.05 .24	64.9 2.5
Aug. 6.8	11.64 .25	5.3 1.3	42.54 .25	13.9 1.8	26.38 .25	33.5 1.3	31.31 .26	62.5 2.1
16.8	11.90 .27	4.1 1.1	42.81 .27	12.2 1.4	26.64 .26	32.3 1.1	31.58 .28	60.6 1.7
26.8	12.18 .27	3.2 0.8	43.08 .28	11.0 1.1	26.91 .27	31.3 0.8	31.88 .30	59.0 1.3
Sept. 5.8	12.45 +.28	2.5 +0.6	43.36 +.28	10.1 +0.7	27.18 +.28	30.6 +0.6	32.18 +.31	58.0 +0.8
15.7	12.73 .28	2.0 +0.3	43.65 .28	9.6 +0.2	27.46 .28	30.2 +0.3	32.50 .31	57.5 +0.2
25.7	13.01 .28	1.9 0.0	43.93 .28	9.6 −0.2	27.74 .28	30.1 0.0	32.81 .31	57.6 −0.3
Oct. 5.7	13.28 .27	2.1 −0.3	44.21 .27	10.1 0.7	28.02 .27	30.3 −0.3	33.12 .30	58.2 0.9
15.7	13.55 .26	2.6 0.6	44.48 .26	11.0 1.1	28.28 .26	30.8 0.6	33.42 .29	59.3 1.4
25.6	13.80 +.24	3.3 −0.8	44.73 +.24	12.3 −1.5	29.54 +.25	31.6 −0.9	33.70 +.27	61.0 −1.9
Nov. 4.6	14.04 .22	4.2 1.1	44.96 .22	13.9 1.8	28.77 .23	32.6 1.1	33.95 .24	63.1 2.3
14.6	14.25 .20	5.4 1.2	45.18 .20	15.8 2.0	28.99 .20	33.8 1.3	34.18 .21	65.6 2.6
24.5	14.44 .17	6.7 1.3	45.36 .16	18.0 2.2	29.18 .17	35.1 1.4	34.37 .17	68.3 2.8
Dec. 4.5	14.59 .14	8.0 1.4	45.50 .13	20.2 2.3	29.34 .14	36.5 1.4	34.52 .13	71.2 3.0
14.5	14.71 +.10	9.4 −1.4	45.61 +.09	22.5 −2.3	29.46 +.10	37.9 −1.4	34.62 +.08	74.2 −3.0
24.5	14.79 .06	10.7 1.3	45.67 +.04	24.8 2.2	29.54 .06	39.3 1.4	34.68 +.03	77.2 2.9
34.4	14.82 +.02	12.0 −1.2	45.69 −.01	26.9 −2.0	29.58 +.02	40.6 −1.2	34.68 −.03	80.0 −2.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Orionis.		ν Orionis.		22 Camelop. (H.)		μ Geminorum.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	5h 48m	+7° 22′	6h 1m	+14° 46′	6h 6m	+69° 21′	6h 16m	+22° 34′
	s	″	s	″	s	″	s	″
(Dec. 30.5	61.17 +.05	54.7 −0.9	5.04 +.07	41.5 −0.4	20.16 +.12	20.6 +2.7	5.10 +.09	5.3 0.0
Jan. 9.5	61.20 +.01	53.9 0.8	5.09 +.02	41.1 0.4	20.22 −.01	23.3 2.6	5.17 +.04	5.3 +0.1
19.4	61.19 −.04	53.2 0.7	5.09 −.02	40.7 0.3	20.14 .13	25.8 2.4	5.18 −.01	5.4 0.1
29.4	61.13 .08	52.6 0.5	5.04 .07	40.5 0.2	19.95 .25	28.1 2.2	5.15 .06	5.6 0.2
Feb. 8.4	61.03 .12	52.1 0.4	4.95 .11	40.3 0.1	19.64 .36	30.2 1.9	5.07 .11	5.8 0.2
18.3	60.90 −.15	51.7 −0.3	4.82 −.14	40.2 −0.1	19.24 −.44	32.0 +1.5	4.94 −.14	6.0 +0.2
28.3	60.73 .17	51.5 0.2	4.66 .17	40.2 0.0	18.75 .51	33.3 1.1	4.78 .17	6.2 0.2
Mar. 10.3	60.56 .18	51.3 −0.1	4.48 .18	40.1 0.0	18.22 .55	34.1 0.6	4.60 .19	6.4 0.1
20.3	60.37 .19	51.3 0.0	4.29 .19	40.1 0.0	17.66 .56	34.4 +0.1	4.40 .20	6.5 +0.1
30.2	60.18 .18	51.4 +0.1	4.10 .18	40.2 0.0	17.10 .55	34.3 −0.4	4.21 .19	6.5 0.0
Apr. 9.2	60.02 −.16	51.6 +0.2	3.93 −.17	40.2 +0.1	16.56 −.51	33.6 −0.9	4.02 −.18	6.5 0.0
19.2	59.87 .13	51.8 0.4	3.77 .14	40.3 0.1	16.08 .44	32.5 1.3	3.85 .15	6.5 0.0
29.2	59.75 .10	52.2 0.5	3.65 .11	40.5 0.2	15.68 .37	31.0 1.7	3.72 .12	6.4 −0.1
May 9.1	59.67 .06	52.8 0.6	3.56 .07	40.7 0.2	15.35 .27	29.2 2.0	3.61 .08	6.4 0.1
19.1	59.63 −.02	53.4 0.7	3.51 −.03	41.0 0.3	15.13 .17	27.1 2.2	3.55 −.04	6.3 0.1
29.1	59.63 +.02	54.2 +0.8	3.50 +.01	41.3 +0.4	15.02 −.06	24.8 −2.3	3.53 .00	6.2 −0.1
June 8.0	59.67 .06	55.0 0.9	3.54 .06	41.7 0.5	15.02 +.06	22.4 2.4	3.56 +.05	6.1 0.0
18.0	59.75 .10	55.9 1.0	3.62 .10	42.2 0.5	15.13 .17	20.0 2.4	3.63 .09	6.1 0.0
28.0	59.88 .14	56.9 1.0	3.74 .13	42.7 0.6	15.35 .27	17.6 2.4	3.74 .13	6.2 +0.1
July 8.0	60.03 .17	58.0 1.1	3.89 .17	43.3 0.6	15.67 .37	15.2 2.3	3.88 .17	6.3 0.1
17.9	60.22 +.20	59.0 +1.1	4.07 +.20	44.0 +0.6	16.09 +.46	13.0 −2.1	4.06 +.20	6.4 +0.1
27.9	60.44 .23	60.1 1.0	4.29 .23	44.6 0.6	16.59 .54	11.1 1.9	4.28 .23	6.6 0.2
Aug. 6.9	60.68 .25	61.1 0.9	4.53 .25	45.2 0.6	17.16 .60	9.4 1.6	4.52 .25	6.7 0.1
16.9	60.93 .26	61.9 0.8	4.78 .26	45.7 0.5	17.79 .66	7.9 1.3	4.77 .27	6.8 0.1
26.8	61.20 .27	62.6 0.6	5.05 .28	46.2 0.4	18.47 .70	6.8 1.0	5.06 .29	7.0 +0.1
Sept. 5.8	61.48 +.28	63.2 +0.4	5.34 +.29	46.5 +0.3	19.19 +.73	5.9 −0.7	5.34 +.30	7.0 0.0
15.8	61.76 .28	63.5 +0.2	5.62 .29	46.7 +0.1	19.94 .75	5.4 −0.3	5.64 .30	7.0 0.0
25.7	62.04 .28	63.6 0.0	5.92 .29	46.8 0.0	20.70 .76	5.3 0.0	5.95 .31	7.0 −0.1
Oct. 5.7	62.33 .28	63.5 −0.2	6.21 .29	46.7 −0.2	21.46 .76	5.5 +0.4	6.26 .31	6.8 0.2
15.7	62.60 .27	63.2 0.4	6.50 .29	46.4 0.3	22.21 .74	6.2 0.8	6.57 .31	6.6 0.2
25.7	62.87 +.26	62.6 −0.6	6.79 +.28	46.0 −0.4	22.94 +.71	7.1 +1.2	6.88 +.30	6.3 −0.3
Nov. 4.6	63.13 .25	61.9 0.8	7.06 .26	45.6 0.5	23.63 .66	8.4 1.5	7.17 .29	6.0 0.3
14.6	63.37 .22	61.1 0.9	7.31 .24	45.0 0.6	24.27 .60	10.1 1.8	7.45 .27	5.7 0.3
24.6	63.58 .20	60.1 1.0	7.54 .22	44.4 0.6	24.83 .52	12.1 2.1	7.70 .24	5.5 0.3
Dec. 4.6	63.76 .17	59.2 1.0	7.74 .18	43.8 0.6	25.31 .43	14.4 2.4	7.93 .21	5.2 0.2
14.5	63.90 +.13	58.2 −1.0	7.91 +.15	43.2 −0.6	25.68 +.32	16.8 +2.5	8.12 +.17	5.1 −0.1
24.5	64.01 .08	57.2 0.9	8.04 .10	42.7 0.5	25.95 .20	19.4 2.6	8.27 .12	5.0 0.0
34.5	64.08 +.04	56.4 −0.8	8.12 +.06	42.3 −0.5	26.08 +.07	22.1 +2.8	8.37 +.07	5.0 0.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Argus. (*Canopus.*)		γ Geminorum.		α Canis Majoris. (*Sirius.*)		ε Canis Majoris.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 6 21	° ′ −52 37	h m 6 31	° ′ +16 29	h m 6 40	° ′ −16 33	h m 6 54	° ′ −28 48
	s	″	s	″	s	″	s	″
(Dec. 30.5)	27.61 +.01	72.6 −3.5	8.78 +.10	33.3 −0.4	8.81 +.08	49.7 −2.4	10.26 +.09	73.3 −2.9
Jan. 9.5	27.58 −.06	76.0 3.3	8.86 +.05	33.0 0.3	8.87 +.04	52.0 2.2	10.33 +.04	76.2 2.8
19.4	27.48 .13	79.2 3.0	8.88 .00	32.7 0.2	8.88 −.01	54.2 2.0	10.34 −.02	78.9 2.6
29.4	27.32 .20	82.1 2.7	8.86 −.04	32.5 −0.1	8.85 .06	56.1 1.8	10.30 .07	81.4 2.3
Feb. 8.4	27.09 .25	84.5 2.3	8.80 .09	32.5 0.0	8.77 .10	57.8 1.5	10.20 .11	83.5 2.0
18.4	26.82 −.30	86.6 −1.8	8.68 −.13	32.5 0.0	8.64 −.14	59.1 −1.2	10.07 −.16	85.3 −1.6
28.3	26.50 .33	88.1 1.3	8.54 .16	32.5 +0.1	8.48 .17	60.1 0.9	9.89 .19	86.8 1.3
Mar. 10.3	26.15 .36	89.2 0.8	8.37 .18	32.6 0.1	8.30 .19	60.8 0.6	9.69 .21	87.8 0.8
20.3	25.79 .36	89.7 −0.2	8.18 .19	32.7 0.1	8.11 .20	61.2 −0.2	9.47 .23	88.5 −0.4
30.3	25.42 .36	89.6 +0.3	7.99 .19	32.8 0.1	7.90 .20	61.3 +0.1	9.24 .23	88.7 0.0
Apr. 9.2	25.07 −.34	89.1 +0.8	7.81 −.17	33.0 +0.1	7.71 −.19	61.1 +0.4	9.02 −.22	88.5 +0.4
19.2	24.74 .32	88.1 1.3	7.64 .15	33.1 0.1	7.53 .17	60.5 0.7	8.81 .20	88.0 0.8
29.2	24.44 .28	86.6 1.7	7.50 .12	33.2 0.2	7.36 .15	59.6 1.0	8.62 .18	87.0 1.1
May 9.1	24.18 .24	84.7 2.1	7.40 .09	33.4 0.2	7.23 .12	58.5 1.3	8.45 .15	85.7 1.5
19.1	23.97 .18	82.3 2.5	7.32 .05	33.6 0.2	7.14 .08	57.1 1.5	8.32 .11	84.0 1.8
29.1	23.81 −.13	79.7 +2.8	7.29 −.01	33.9 +0.3	7.07 −.04	55.4 +1.7	8.23 −.07	82.0 +2.1
June 8.1	23.72 .07	76.7 3.0	7.30 +.03	34.2 0.3	7.05 .00	53.6 1.9	8.17 −.03	79.8 2.3
18.0	23.68 −.01	73.6 3.2	7.35 .07	34.5 0.3	7.07 +.04	51.6 2.0	8.16 +.01	77.4 2.5
28.0	23.70 +.05	70.3 3.3	7.44 .11	34.8 0.4	7.13 .07	49.6 2.1	8.19 .05	74.9 2.6
July 8.0	23.78 .11	67.0 3.3	7.57 .14	35.2 0.4	7.22 .11	47.5 2.1	8.26 .09	72.3 2.6
18.0	23.93 +.17	63.8 +3.2	7.73 +.18	35.6 +0.4	7.35 +.14	45.4 +2.1	8.37 +.13	69.7 +2.6
27.9	24.13 .22	60.7 3.0	7.92 .20	36.0 0.4	7.51 .17	43.4 1.9	8.51 .16	67.2 2.4
Aug. 6.9	24.37 .27	57.8 2.7	8.14 .23	36 4 0.4	7.70 .20	41.5 1.7	8.69 .19	64.8 2.2
16.9	24.66 .31	55.3 2.3	8.38 .25	36.8 0.3	7.91 .22	39.9 1.5	8.90 .22	62.7 1.9
26.8	25.00 .35	53.2 1.8	8.64 .27	37.0 0.2	8.15 .24	38.5 1.2	9.13 .25	61.0 1.6
Sept. 5.8	25.36 +.37	51.7 +1.3	8.91 +.28	37.1 +0.1	8.40 +.26	37.5 +0.8	9.39 +.27	59.5 +1.2
15.8	25.74 .39	50.7 +0.7	9.20 .29	37.1 −0.1	8.67 .27	36.9 +0.4	9.67 .28	58.5 0.7
25.8	26.14 .40	50.4 0.0	9.49 .30	37.0 0.2	8.94 .28	36.7 0.0	9.96 .30	58.1 +0.2
Oct. 5.7	26.55 .40	50.6 −0.6	9.79 .30	36.8 0.3	9.23 .29	36.9 −0.5	10.26 .30	58.2 −0.4
15.7	26.95 .39	51.5 1.2	10.09 .30	36.4 0.5	9.52 .29	37.6 0.9	10.57 .31	58.8 0.9
25.7	27.33 +.37	53.1 −1.8	10.39 +.29	35.9 −0.5	9.80 +.28	38.8 −1.3	10.88 +.30	60.0 −1.4
Nov. 4.7	27.69 .34	55.2 2.3	10.68 .28	35.3 0.6	10.08 .27	40.3 1.7	11.18 .29	61.6 1.9
14.6	28.02 .30	57.8 2.8	10.95 .27	34.6 0.6	10.34 .25	42.1 2.0	11.46 .27	63.7 2.2
24.6	28.29 .25	60.7 3.1	11.21 .24	34.0 0.7	10.58 .23	44.2 2.2	11.72 .24	66.1 2.5
Dec. 4.6	28.51 .19	64.0 3.4	11 44 .21	33.8 0.6	10.80 .19	46.5 2.3	11.95 .21	68.8 2.8
14.5	28.67 +.12	67.5 −3.5	11.64 +.18	32.8 −0.6	10.97 +.16	48.9 −2.4	12.14 +.17	71.7 −2.9
24.5	28.76 .06	71.0 3.5	11.79 .13	32.2 0.5	11.11 .11	51.4 2.4	12.28 .12	74.6 2.9
34.5	28.78 +.02	74.5 −3.4	11.90 +.08	31.8 −0.4	11.20 +.07	53.7 −2.3	12.38 +.07	77.5 −2.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Canis Majoris.		δ Geminorum.		Piazzi vii. 67.		α² Geminorum. (*Castor.*)	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 7 3	° ′ −26 12	h m 7 13	° ′ +22 11	h m 7 18	° ′ +68 41	h m 7 27	° ′ +32 7
	s	″	s	″	s	″	s	″
(Dec.30.5)	46.82 +.10	55.2 −2.9	20.04 +.15	17.0 −0.2	63.57 +.31	35.9 +2.4	20.79 +.18	63.1 +0.3
Jan. 9.5	46.90 +.05	58.0 2.7	20.17 .10	16.8 0.0	63.82 .19	38.3 2.5	20.94 .12	63.6 0.5
19.5	46.92 .00	60.7 2.5	20.24 +.05	16.8 +0.1	63.94 +.06	40.9 2.6	21.03 .07	64.2 0.7
29.4	46.90 −.05	63.1 2.3	20.26 −.01	17.0 0.2	63.94 −.07	43.5 2.6	21.07 +.01	64.9 0.8
Feb. 8.4	46.82 .10	65.2 2.0	20.23 .06	17.2 0.3	63.81 .19	46.0 2.4	21.05 −.05	65.8 0.8
18.4	46.70 −.14	67.0 −1.6	20.15 −.10	17.6 +0.3	63.56 −.30	48.4 +2.2	20.97 −.10	66.6 +0.8
28.4	46.54 .17	68.5 1.3	20.03 .14	17.9 0.4	63.21 .39	50.4 1.9	20.85 .14	67.4 0.8
Mar. 10.3	46.35 .20	69.6 0.9	19.87 .17	18.3 0.4	63.78 .46	52.1 1.5	20.69 .18	68.2 0.7
20.3	46.14 .21	70.2 0.5	19.69 .18	18.7 0.3	62.29 .51	53.3 1.0	20.50 .20	68.8 0.6
30.3	45.92 .22	70.5 −0.1	19.50 .19	19.0 0.3	61.76 .53	54.1 +0.5	20.30 .21	69.4 0.5
Apr. 9.3	45.70 −.21	70.4 +0.3	19.31 −.19	19.2 +0.2	61.23 −.53	54.4 0.0	20.09 −.20	69.8 +0.3
19.2	45.50 .20	69.9 0.7	19.13 .17	19.4 0.2	60.71 .50	54.2 −0.5	19.89 .19	70.0 +0.1
29.2	45.31 .17	69.0 1.0	18.97 .15	19.6 0.1	60.23 .45	53.5 0.9	19.70 .17	70.0 0.0
May 9.2	45.15 .15	67.8 1.4	18.84 .12	19.7 +0.1	59.81 .38	52.4 1.3	19.55 .14	69.9 −0.2
19.1	45.02 .11	66.3 1.7	18.74 .08	19.7 0.0	59.47 .30	50.8 1.7	19.42 .10	69.6 0.3
29.1	44.92 −.08	64.4 +1.9	18.67 −.04	19.7 0.0	59.20 −.22	49.0 −2.0	19.34 −.06	69.2 −0.4
June 8.1	44.87 −.04	62.4 2.2	18.65 −.01	19.7 0.0	59.04 .12	46.9 2.2	19.30 −.02	68.8 0.5
18.1	44.85 .00	60.1 2.4	18.66 +.03	19.7 0.0	58.97 −.02	44.6 2.4	19.30 +.02	68.2 0.6
28.0	44.87 +.04	57.7 2.4	18.71 .07	19.6 0.0	59.00 +.08	42.1 2.5	19.34 .06	67.6 0.6
July 8.0	44.94 .08	55.2 2.5	18.80 .11	19.6 −0.1	59.14 .18	39.6 2.5	19.42 .10	66.9 0.7
18.0	45.04 +.12	52.8 +2.5	18.93 +.14	19.5 −0.1	59.36 +.27	37.1 −2.5	19.54 +.14	66.2 −0.7
28.0	45.17 .15	50.3 2.4	19.09 .17	19.4 0.1	59.68 .36	34.6 2.4	19.70 .17	65.5 0.7
Aug. 6.9	45.34 .18	48.0 2.2	19.28 .20	19.3 0.1	60.09 .44	32.2 2.3	19.89 .21	64.8 0.7
16.9	45.54 .21	46.0 1.9	19.49 .23	19.2 0.2	60.57 .51	30.0 2.1	20.11 .24	64.0 0.8
26.9	45.76 .24	44.3 1.6	19.73 .25	19.0 0.3	61.11 .58	27.9 1.9	20.36 .26	63.3 0.8
Sept. 5.8	46.01 +.26	42.9 +1.2	19.99 +.27	18.7 −0.3	61.72 +.63	26.2 −1.7	20.63 +.26	62.5 −0.8
15.8	46.28 .28	42.0 0.7	20.27 .28	18.3 0.4	62.38 .68	24.6 1.4	20.93 .30	61.7 0.8
25.8	46.56 .29	41.5 +0.2	20.56 .30	17.8 0.5	63.07 .72	23.4 1.1	21.24 .32	61.0 0.8
Oct. 5.8	46.86 .30	41.6 −0.3	20.87 .31	17.3 0.6	63.80 .74	22.5 0.7	21.57 .33	60.2 0.8
15.7	47.16 .30	42.2 0.8	21.18 .32	16.7 0.7	64.54 .75	22.0 −0.3	21.91 .34	59.4 0.7
25.7	47.47 +.30	43.2 −1.3	21.50 +.32	16.0 −0.7	65.30 +.75	21.8 +0.1	22.25 +.35	58.8 −0.6
Nov. 4.7	47.77 .29	44.8 1.8	21.81 .31	15.3 0.7	66.04 .73	22.1 0.5	22.60 .35	58.2 0.6
14.7	48.05 .28	46.8 2.2	22.12 .30	14.6 0.7	66.76 .70	22.8 0.9	22.94 .34	57.6 0.4
24.6	48.32 .25	49.1 2.5	22.42 .28	13.9 0.6	67.43 .65	23.8 1.3	23.27 .32	57.3 0.3
Dec. 4.6	48.55 .22	51.7 2.7	22.69 .26	13.4 0.5	68.05 .58	25.4 1.7	23.58 .29	57.1 −0.1
14.6	48.75 +.18	54.4 −2.8	22.93 +.22	12.9 −0.4	68.58 +.49	27.2 +2.0	23.86 +.26	57.1 +0.1
24.5	48.91 .13	57.3 2.8	23.14 .18	12.5 0.3	69.02 .38	29.3 2.3	24.09 .21	57.2 0.3
34.5	49.02 +.08	60.1 −2.7	23.30 +.13	12.3 −0.1	69.35 +.27	31.7 +2.5	24.28 +.16	57.6 +0.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Canis Minoris. (*Procyon.*)		β Geminorum. (*Pollux.*)		φ Geminorum.		3 Ursæ Majoris (H.)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 7 33	° ′ + 5 30	h m 7 38	° ′ +28 17	h m 7 46	° ′ +27 3	h m 8 1	° ′ +68 47
	s	″	s	″	s	″	s	″
(Dec. 30.5)	21.18 +.15	49.4 −1.3	21.52 +.18	49.9 +0.1	32.32 +.19	23.6 0.0	29.97 +.41	73.9 +2.1
Jan. 9.5	21.31 .11	48.2 1.2	21.68 .13	50.1 0.3	32.48 .14	23.7 +0.2	30.33 .30	76.2 2.4
19.5	21.39 .06	47.1 1.0	21.78 .08	50.4 0.4	32.59 .08	24.0 0.3	30.56 .17	78.7 2.6
29.5	21.43 +.01	46.2 0.8	21.83 +.02	50.9 0.5	32.65 +.03	24.4 0.5	30.67 +.04	81.4 2.6
Feb. 8.4	21.41 −.04	45.4 0.6	21.82 −.04	51.5 0.6	32.65 −.03	24.9 0.6	30.64 −.09	84.0 2.6
18.4	21.34 −.09	44.9 −0.5	21.76 −.09	52.2 +0.7	32.60 −.08	25.6 +0.6	30.50 −.21	86.6 +2.5
28.4	21.24 .12	44.5 0.3	21.65 .13	52.9 0.7	32.50 .12	26.2 0.7	30.23 .31	88.9 2.2
Mar. 10.3	21.10 .15	44.3 −0.1	21.50 .16	53.6 0.7	32.36 .15	26.9 0.7	29.87 .40	91.0 1.9
20.3	20.94 .17	44.2 0.0	21.32 .18	54.2 0.6	32.19 .18	27.5 0.6	29.43 .46	92.7 1.5
30.3	20.76 .18	44.3 +0.1	21.13 .20	54.7 0.5	32.00 .19	28.1 0.5	28.94 .51	94.0 1.0
Apr. 9.3	20.59 −.18	44.5 +0.2	20.93 −.20	55.2 +0.4	31.81 −.19	28.5 +0.4	28.42 −.52	94.8 +0.6
19.2	20.42 .16	44.8 0.4	20.74 .19	55.5 0.2	31.62 .18	28.9 0.3	27.90 .51	95.1 +0.1
29.2	20.26 .15	45.2 0.5	20.56 .17	55.6 +0.1	31.44 .17	29.1 +0.2	27.39 .49	95.0 −0.4
May 9.2	20.12 .12	45.7 0.5	20.40 .14	55.7 0.0	31.29 .14	29.2 0.0	26.92 .44	94.3 0.9
19.2	20.02 .09	46.3 0.6	20.28 .11	55.6 −0.1	31.16 .11	29.2 −0.1	26.52 .37	93.2 1.3
29.1	19.94 −.06	46.9 +0.7	20.19 −.07	55.4 −0.2	31.07 −.07	29.1 −0.2	26.18 −.30	91.8 −1.7
June 8.1	19.90 −.03	47.6 0.7	20.14 −.03	55.1 0.3	31.02 −.03	28.9 0.2	25.92 .21	89.9 2.0
18.1	19.89 +.01	48.4 0.8	20.13 +.01	54.8 0.4	31.00 .00	28.6 0.3	25.76 .12	87.8 2.3
28.0	19.91 .04	49.2 0.8	20.16 .05	54.4 0.4	31.03 +.04	28.3 0.4	25.68 −.02	85.4 2.4
July 8.0	19.98 .08	50.1 0.8	20.23 .09	53.9 0.5	31.09 .08	27.9 0.4	25.71 +.07	82.9 2.6
18.0	20.07 +.11	50.9 +0.8	20.34 +.12	53.4 −0.5	31.18 +.11	27.4 −0.5	25.83 +.16	80.2 −2.7
28.0	20.19 .14	51.7 0.7	20.48 .16	52.9 0.6	31.32 .15	26.9 0.5	26.04 .26	77.6 2.7
Aug. 6.9	20.34 .16	52.4 0.6	20.65 .19	52.3 0.6	31.48 .18	26.4 0.6	26.34 .34	74.9 2.6
16.9	20.52 .19	53.0 0.5	20.85 .22	51.7 0.6	31.67 .21	25.8 0.6	26.72 .42	72.4 2.5
26.9	20.72 .21	53.4 0.3	21.08 .24	51.0 0.7	31.89 .23	25.2 0.7	27.18 .49	69.9 2.4
Sept. 5.9	20.95 +.23	53.6 +0.1	21.33 +.26	50.3 −0.7	32.14 +.26	24.5 −0.7	27.70 +.56	67.6 −2.2
15.8	21.19 .25	53.6 −0.1	21.61 .28	49.6 0.8	32.40 .28	23.7 0.8	28.30 .62	65.5 1.9
25.8	21.45 .27	53.4 0.3	21.90 .30	48.8 0.8	32.69 .30	22.9 0.8	28.94 .67	63.7 1.7
Oct. 5.8	21.73 .28	53.0 0.6	22.22 .32	48.0 0.8	33.00 .31	22.0 0.9	29.63 .71	62.2 1.3
15.7	22.02 .29	52.2 0.8	22.54 .33	47.2 0.8	33.32 .33	21.1 0.9	30.36 .74	61.0 1.0
25.7	22.31 +.30	51.3 −1.0	22.87 +.34	46.4 −0.8	33.65 +.33	20.2 −0.9	31.10 +.75	60.2 −0.6
Nov. 4.7	22.61 .29	50.2 1.2	23.21 .34	45.6 0.7	33.99 .34	19.4 0.8	31.86 .75	59.8 −0.2
14.7	22.90 .29	48.9 1.4	23.54 .33	44.9 0.7	34.32 .33	18.6 0.8	32.61 .74	59.9 +0.3
24.6	23.18 .27	47.5 1.4	23.87 .31	44.3 0.5	34.65 .32	17.9 0.7	33.34 .70	60.4 0.7
Dec. 4.6	23.44 .25	46.0 1.5	24.17 .29	43.8 0.4	34.95 .29	17.3 0.5	34.02 .65	61.4 1.2
14.6	23.68 +.22	44.5 −1.4	24.44 +.26	43.5 −0.2	35.23 +.26	16.9 −0.3	34.63 +.57	62.8 +1.6
24.6	23.88 .18	43.1 1.4	24.68 .21	43.4 0.0	35.48 .22	16.6 −0.1	35.16 .48	64.5 2.0
34.5	24.04 +.14	41.8 −1.3	24.87 +.17	43.5 +0.2	35.68 +.18	16.6 +0.1	35.60 +.39	66.7 +2.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	15 Argus (ι)		η Cancri.		ε Hydræ.		ι Ursæ Majoris.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 8 2	° ′ −23 58	h m 8 26	° ′ +20 49	h m 8 40	° ′ + 6 49	h m 8 51	° ′ +48 28
	s	″	s	″	s	″	s	″
(Dec. 30.6	42.75 +.17	40.6 −2.8	7.94 +.22	27.7 −0.6	45.29 +.21	61.5 −1.4	24.92 +.32	62.5 +0.8
Jan. 9.5	42.89 .12	43.4 2.8	8.14 .17	27.2 0.4	45.49 .17	60.2 1.3	25.21 .26	63.5 1.1
19.5	42.98 .06	46.1 2.6	8.29 .12	26.9 −0.2	45.64 .12	59.0 1.1	25.43 .19	64.8 1.4
29.5	43.02 +.01	48.7 2.4	8.38 .07	26.9 0.0	45.74 .07	58.0 0.9	25.59 .12	66.3 1.6
Feb. 8.5	43.00 − 04	51.0 2.2	8.42 +.01	27.0 +0.2	45.78 +.02	57.3 0.6	25.67 +.05	68.0 1.8
18.4	42.94 −.09	53.0 −1.9	8.41 −.04	27.3 +0.4	45.78 −.02	56.8 −0.4	25.68 −.03	69.8 +1.9
28.4	42.83 .13	54.8 1.6	8.35 .08	27.8 0.5	45.74 .07	56.4 0.2	25.62 .09	71.7 1.8
Mar. 10.4	42.68 .16	56.2 1.2	8.24 .12	28.3 0.5	45.65 .10	56.3 −0.1	25.50 .15	73.5 1.8
20.4	42.51 .18	57.2 0.8	8.11 .15	28.8 0.6	45.53 .13	56.3 +0.1	25.32 .20	75.2 1.6
30.3	42.32 .20	57.9 0.5	7.95 .17	29.4 0.6	45.38 .15	56.4 0.2	25.10 .23	76.7 1.3
Apr. 9.3	42.12 −.20	58.2 −0.1	7.78 −.17	30.0 +0.5	45.23 −.16	56.7 +0.3	24.86 −.25	77.9 +1.1
19.3	41.92 .19	58.1 +0.2	7.60 .17	30.5 0.5	45.07 .16	57.1 0.4	24.61 .25	78.8 0.7
29.3	41.73 .18	57.7 0.6	7.43 .16	30.9 0.4	44.91 .15	57.5 0.5	24.36 .25	79.4 +0.4
May 9.2	41.56 .16	57.0 0.9	7.28 .14	31.3 0.3	44.76 .14	58.1 0.5	24.11 .23	79.6 0.0
19.2	41.41 .14	55.9 1.2	7.14 .12	31.6 0.3	44.63 .12	58.6 0.6	23.89 .21	79.5 −0.3
29.2	41.28 −.11	54.5 +1.5	7.04 −.09	31.8 +0.2	44.52 −.10	59.2 +0.6	23.70 −.17	79.1 −0.6
June 8.1	41.19 .08	52.9 1.8	6.96 .06	31.9 +0.1	44.44 .07	59.9 0.7	23.55 .13	78.3 0.9
18.1	41.13 .04	51.0 2.0	6.91 −.03	32.0 0.0	44.39 .04	60.5 0.7	23.44 .09	77.2 1.2
28.1	41.10 −.01	48.9 2.1	6.90 .00	32.0 0.0	44.36 −.01	61.2 0.7	23.37 −.05	76.0 1.4
July 8.1	41.11 +.03	46.7 2.2	6.92 +.04	31.9 −0.1	44.36 +.02	61.8 0.6	23.35 .00	74.5 1.6
18.0	41.16 +.06	44.5 +2.2	6.97 +.07	31.8 −0.2	44.40 +.05	62.4 +0.6	23.37 +.05	72.8 −1.8
28.0	41.23 .09	42.3 2.2	7.06 .10	31.6 0.3	44.46 .08	63.0 0.5	23.44 .09	70.9 1.9
Aug. 7.0	41.34 .13	40.1 2.1	7.18 .13	31.2 0.4	44.55 .11	63.5 0.4	23.56 .14	69.0 2.0
17.0	41.49 .16	38.1 1.9	7.32 .16	30.8 0.5	44.67 .13	63.8 0.3	23.71 .18	67.0 2.0
26.9	41.66 .19	36.3 1.6	7.50 .19	30.3 0.6	44.82 .16	64.0 +0.1	23.91 .22	64.9 2.1
Sept. 5.9	41.86 +.22	34.9 +1.3	7.70 +.21	29.7 −0.7	44.99 +.19	64.1 −0.1	24.16 +.26	62.9 −2.1
15.9	42.09 .24	33.8 0.9	7.92 .24	28.9 0.8	45.19 .21	63.9 0.3	24.44 .30	60.8 2.0
25.8	42.35 .27	33.1 +0.4	8.17 .26	28.0 0.9	45.42 .24	63.5 0.5	24.75 .33	58.8 1.9
Oct. 5.8	42.62 .28	32.9 0.0	8.45 .28	27.0 1.0	45.66 .26	62.8 0.8	25.10 .37	57.0 1.8
15.8	42.92 .30	33.2 −0.5	8.74 .30	25.9 1.1	45.93 .28	61.9 1.0	25.49 .40	55.2 1.7
25.8	43.22 +.31	34.0 −1.0	9.05 +.32	24.8 −1.2	46.22 +.30	60.8 −1.2	25.90 +.42	53.6 −1.4
Nov. 4.7	43.53 .31	35.3 1.5	9.38 .33	23.6 1.2	46.52 .31	59.5 1.4	26.33 .44	52.3 1.2
14.7	43.84 .30	37.0 1.9	9.70 .33	22.3 1.2	46.83 .31	58.1 1.5	26.77 .44	51.3 0.9
24.7	44.14 .29	39.1 2.3	10.03 .32	21.1 1.1	47.14 .31	56.5 1.6	27.21 .44	50.6 0.6
Dec. 4.7	44.42 .27	41.5 2.5	10.34 .30	20.0 1.0	47.44 .29	54.9 1.6	27.65 .42	50.2 −0.2
14.6	44.67 +.23	44.2 −2.7	10.64 +.28	19.1 −0.9	47.73 +.27	53.3 −1.6	28.06 +.39	50.2 +0.2
24.6	44.89 .19	46.9 2.8	10.90 .25	18.3 0.7	47.98 .24	51.7 1.5	28.44 .35	50.5 0.6
34.6	45.06 +.15	49.7 −2.8	11.13 +.21	17.7 −0.5	48.21 +.20	50.3 −1.4	28.76 +.30	51.3 +0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ² Ursæ Majoris.		κ Cancri.		ι Argus.		1 Draconis (H.)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	9h 0m	+67° 35′	9h 1m	+11° 7′	9h 14m	−58° 47′	9h 20m	+81° 49′
	s	″	s	″	s	″	s	″
(Dec. 30.6	22.58 +.51	29.1 +1.5	35.22 +.24	25.3 −1.3	4.91 +.31	43.9 −3.4	49.00 1.32	24.8 +1.9
Jan. 9.6	23.05 .42	30.9 2.0	35.44 .20	24.1 1.1	5.18 .23	47.4 3.6	50.21 1.08	26.9 2.3
19.6	23.41 .31	33.1 2.3	35.61 .15	23.1 0.9	5.38 .15	51.1 3.7	51.16 +.81	29.5 2.7
29.5	23.66 .19	35.5 2.5	35.73 .10	22.4 0.6	5.49 +.07	54.9 3.7	51.83 .52	32.3 2.9
Feb. 8.5	23.79 +.07	38.1 2.7	35.80 +.05	21.8 0.4	5.51 −.01	58.6 3.6	52.19 +.21	35.4 3.1
18.5	23.79 −.06	40.8 +2.7	35.82 .00	21.6 −0.2	5.46 −.09	62.2 −3.4	52.24 −.10	38.5 +3.1
28.4	23.68 .17	43.4 2.6	35.80 −.05	21.4 0.0	5.33 .16	65.5 3.2	51.98 .40	41.5 3.0
Mar. 10.4	23.46 .27	45.9 2.4	35.73 .09	21.5 +0.2	5.13 .23	68.5 2.9	51.44 .68	44.4 2.8
20.4	23.14 .35	48.2 2.1	35.62 .12	21.8 0.3	4.88 .28	71.2 2.5	50.63 .91	47.0 2.4
30.4	22.76 .41	50.1 1.7	35.49 .14	22.1 0.4	4.57 .32	73.4 2.0	49.61 1.11	49.3 2.0
Apr. 9.3	22.32 −.45	51.6 +1.3	35.34 −.15	22.5 +0.4	4.24 −.35	75.2 −1.6	48.42 1.25	51.1 +1.5
19.3	21.85 .48	52.7 0.8	35.19 .16	23.0 0.5	3.88 .36	76.5 1.1	47.11 1.34	52.3 1.0
29.3	21.37 .47	53.2 +0.3	35.03 .15	23.5 0.5	3.51 .37	77.3 −0.5	45.75 1.37	53.0 +0.4
May 9.3	20.90 .45	53.3 −0.2	34.88 .14	24.0 0.5	3.14 .37	77.6 0.0	44.37 1.35	53.2 −0.1
19.2	20.46 .42	52.9 0.6	34.75 .13	24.6 0.5	2.77 .35	77.4 +0.5	43.04 1.29	52.8 0.7
29.2	20.07 −.36	52.1 −1.1	34.64 −.10	25.1 +0.5	2.43 −.33	76.6 +1.0	41.79 1.18	51.8 −1.2
June 8.2	19.73 .30	50.8 1.5	34.54 .08	25.6 0.5	2.11 .30	75.4 1.5	40.67 1.04	50.3 1.7
18.1	19.46 .23	49.1 1.9	34.48 .05	26.1 0.5	1.83 .26	73.7 1.9	39.71 .87	48.4 2.1
28.1	19.27 .15	47.0 2.2	34.44 −.03	26.5 0.4	1.59 .22	71.6 2.3	38.93 .67	46.0 2.5
July 8.1	19.16 −.07	44.7 2.4	34.43 .00	27.0 0.4	1.40 .17	69.2 2.6	38.36 .46	43.3 2.8
18.1	19.13 +.01	42.2 −2.6	34.44 +.03	27.3 +0.3	1.26 −.11	66.5 +2.8	38.01 −.24	40.4 −3.1
28.0	19.18 .10	39.5 2.8	34.49 .06	27.6 0.2	1.18 −.05	63.5 3.0	37.89 −.02	37.2 3.2
Aug. 7.0	19.32 .18	36.7 2.8	34.56 .09	27.8 +0.1	1.16 +.01	60.5 3.1	37.99 +.22	33.9 3.3
17.0	19.54 .26	33.8 2.9	34.67 .12	27.8 0.0	1.21 .08	57.4 3.0	38.33 .45	30.6 3.4
27.0	19.83 .33	31.0 2.8	34.80 .14	27.7 −0.2	1.32 .15	54.4 2.9	38.89 .67	27.2 3.3
Sept. 5.9	20.20 +.41	28.2 −2.7	34.95 +.17	27.5 −0.4	1.50 +.21	51.6 +2.6	39.66 +.88	24.0 −3.2
15.9	20.64 .47	25.5 2.6	35.14 .20	27.0 0.6	1.75 .28	49.1 2.3	40.64 1.08	20.8 3.0
25.9	21.15 .54	23.0 2.4	35.35 .23	26.4 0.8	2.06 .34	47.0 1.8	41.81 1.26	17.9 2.8
Oct. 5.8	21.72 .60	20.7 2.1	35.60 .25	25.5 1.0	2.43 .39	45.5 1.3	43.16 1.42	15.3 2.5
15.8	22.35 .64	18.7 1.8	35.86 .27	24.4 1.1	2.84 .44	44.4 0.7	44.65 1.56	13.0 2.1
25.8	23.01 +.68	17.0 −1.5	36.14 +.29	23.2 −1.3	3.30 +.47	44.0 +0.1	46.28 1.67	11.1 −1.7
Nov. 4.8	23.71 .71	15.7 1.1	36.45 .31	21.8 1.5	3.78 .49	44.2 −0.6	47.99 1.75	9.7 1.2
14.7	24.43 .72	14.8 0.6	36.76 .32	20.3 1.5	4.27 .49	45.1 1.2	49.77 1.78	8.8 0.6
24.7	25.15 .71	14.5 −0.1	37.08 .32	18.7 1.6	4.76 .48	46.6 1.8	51.56 1.77	8.4 −0.1
Dec. 4.7	25.85 .68	14.6 +0.4	37.39 .31	17.2 1.6	5.23 .45	48.7 2.4	53.32 1.72	8.6 +0.5
14.7	26.52 +.64	15.2 +0.8	37.69 +.29	15.6 −1.5	5.66 +.41	51.4 −2.8	54.99 1.61	9.4 +1.1
24.6	27.12 .57	16.3 1.3	37.97 .26	14.2 1.4	6.04 .35	54.4 3.2	56.53 1.45	10.7 1.6
34.6	27.66 +.49	17.8 +1.8	38.21 +.23	12.9 −1.2	6.36 +.28	57.8 −3.5	57.89 1.24	12.6 +2.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Hydræ.		*d* Ursæ Majoris.		*θ* Ursæ Majoris.		*ε* Leonis.	
	Right Ascension.	Declination *South*.	Right Ascension.	Declination *North*.	Right Ascension.	Declination *North*.	Right Ascension.	Declination *North*.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	9 21	− 8 9	9 24	+70 19	9 25	+52 11	9 39	+24 17
	s	″	s	″	s	″	s	″
(Dec. 30.6)	60.07 +.24	58.8 −2.3	24.42 +.62	31.0 +1.4	14.40 +.37	29.3 +0.6	23.39 +.28	43.0 −0.8
Jan. 9.6	60.30 .20	61.0 2.1	24.99 .57	32.6 1.9	14.75 .32	30.1 1.1	23.66 .24	42.3 0.5
19.6	60.47 .16	63.1 2.0	25.45 .40	34.7 2.3	15.04 .25	31.4 1.4	23.88 .20	42.0 −0.2
29.5	60.60 .11	65.0 1.8	25.78 .27	37.2 2.6	15.25 .17	33.0 1.7	24.05 .15	41.9 +0.1
Feb. 8.5	60.69 .06	66.8 1.6	25.99 +.13	39.8 2.7	15.38 .10	34.8 1.9	24.17 .09	42.1 0.3
18.5	60.72 +.01	68.3 −1.4	26.05 .00	42.6 +2.8	15.44 +.02	36.8 +2.1	24.24 +.04	42.6 +0.6
28.4	60.70 −.04	69.5 1.1	25.98 −.13	45.4 2.7	15.42 −.06	38.9 2.1	24.25 −.01	43.3 0.8
Mar. 10.4	60 65 .07	70.5 0.9	25.78 .25	48.1 2.6	15.33 .12	41.0 2.1	24.21 .06	44.1 0.9
20.4	60.55 .11	71.2 0.6	25.48 .35	50.6 2.3	15.18 .18	43.0 1.9	24.14 .10	45.0 0.9
30.4	60.44 .13	71.7 0.4	25.08 .43	52.8 2.0	14.98 .22	44.9 1.7	24.02 .13	46.0 1.0
Apr. 9.3	60.30 −.14	71.9 −0.1	24.61 −.49	54.6 +1.6	14.74 −.25	46.4 +1.4	23.88 −.15	46.9 +0.9
19.3	60.15 .15	71.9 +0.1	24.09 .53	55.9 1.1	14.47 .27	47.7 1.1	23.73 .16	47.8 0.9
29.3	59.99 .15	71.7 0.3	23.55 .54	56.8 0.6	14.20 .27	48.6 0.7	23.57 .16	48.6 0.8
May 9.3	59.84 .14	71.3 0.5	23.01 .53	57.1 +0.1	13.93 .26	49.1 +0.3	23.42 .15	49.3 0.6
19.2	59.71 .13	70.7 0.7	22.49 .50	57.0 −0.4	13.68 .24	49.3 0.0	23.26 .14	49.9 0.5
29.2	59.58 −.12	70.0 +0.8	22.01 −.45	56.3 −0.9	13.45 −.22	49.0 −0.4	23.13 −.13	50.3 +0.3
June 8.2	59.47 .10	69.0 1.0	21.58 .39	55.2 1.4	13.24 .18	48.4 0.8	23.01 .11	50.6 +0.2
18.1	59.39 .07	68.0 1.1	21.22 .32	53.6 1.8	13.08 .14	47.4 1.1	22.92 .08	50.7 0.0
28.1	59.33 .05	66.8 1 2	20.94 .24	51.7 2.1	12.96 .10	46.2 1.4	22.85 .06	50.6 −0.1
July 8.1	59.29 −.02	65.6 1.3	20.74 .15	49.4 2.4	12.88 .05	44.6 1.7	22.80 −.03	50.4 0.3
18.1	59.28 .00	64.3 +1.3	20.63 −.06	46.8 −2.7	12.85 −.01	42.8 −1.9	22.79 .00	50.0 −0.4
28.0	59.30 +.03	63.0 1.3	20.61 +.03	44 0 2.9	12.87 +.04	40.8 2.1	22.80 +.03	49.5 0.6
Aug. 7.0	59.34 .06	61.8 1.2	20.69 .12	41.1 3.0	12.93 .09	38.6 2.2	22.84 .06	48.9 0.7
17.0	59.41 .09	60.7 1.0	20.86 .21	38.1 3.0	13.04 .14	36.3 2.4	22.91 .09	48.1 0.9
27.0	59.51 .12	59.7 0.9	21.11 .30	35.0 3.0	13.20 .18	33.9 2.4	23.02 .12	47.1 1.0
Sept. 5.9	59.64 +.15	59.0 +0.6	21.46 +.39	32.0 −3.0	13.40 +.23	31.5 −2.4	23.15 +.15	46.0 −1.2
15.9	59.80 .18	58.5 +0.4	21 89 .47	29.0 2.9	13.65 .27	29.0 2.4	23.31 .18	44.8 1.3
25.9	60.00 .21	58.2 0.0	22.40 .55	26.2 2.7	13.95 .32	26.6 2.4	23.51 .21	43.4 1.5
Oct. 5.8	60.22 .23	58.4 −0.3	22.98 .63	23.6 2.5	14.29 .36	24.3 2.2	23.74 .24	41.8 1.6
15.8	60.46 .26	58.8 0.7	23.64 .68	21.3 2.2	14.66 .40	22.1 2.2	24.00 .27	40.2 1.6
25.8	60.74 +.28	59.7 −1.0	24.35 +.74	19.3 −1.8	15.08 +.43	20.2 −1.9	24.28 +.30	38.5 −1.7
Nov. 4.8	61.03 .30	60.9 1.3	25.11 .78	17.7 1.4	15.52 .45	18.4 1.6	24.60 .32	36.8 1.7
14.7	61.33 .31	62.4 1.6	25.90 .80	16.6 0.9	15.98 .47	17.0 1.3	24.93 .34	35.1 1.7
24.7	61.65 .31	64.1 1.9	26.70 .80	15.9 −0.4	16.46 .47	15.9 0.9	25.27 .34	33.5 1.6
Dec. 4.7	61.96 .30	66.1 2.1	27.50 .78	15.7 +0.1	16.93 .47	15.2 −0.5	25.62 .34	32.0 1.4
14.7	62.25 +.29	68.2 −2.2	28.26 +.74	16.1 +0.6	17.39 +.44	15.0 0.0	25.95 +.33	30.7 −1.2
24.6	62.53 .26	70.5 2.2	28.98 .67	17 0 1.2	17.81 .40	15.1 +0.4	26.27 .31	29.6 1.0
34.6	62.78 +.22	72.7 −2.2	29.61 +.59	18.4 +1.6	18.20 +.36	15.7 +0.8	26.56 +.27	28.7 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	μ Leonis.		α Leonis. (*Regulus.*)		32 Ursæ Majoris.		γ¹ Leonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 9 46 s	° ′ +26 32 ″	h m 10 2 s	° ′ +12 31 ″	h m 10 9 s	° ′ +65 40 ″	h m 10 13 s	° ′ +20 24 ″
(Dec. 30.6)	17.33 +.29	23.7 −0.8	18.60 +.28	17.6 −1.5	45.22 +.58	15.9 +0.8	41.67 +.32	53.6 −1.2
Jan. 9.6	17.60 .25	23.1 0.4	18.86 .25	16.2 1.2	45.77 .51	16.9 1.3	41.95 .27	52.6 0.9
19.6	17.83 .21	22.8 −0.1	19.09 .20	15.1 1.0	46.25 .43	18.4 1.7	42.20 .22	51.8 0.6
29.6	18.02 .16	22.9 +0.2	19.27 .16	14.3 0.7	46.62 .33	20.4 2.1	42.40 .18	51.4 −0.3
Feb. 8.5	18.15 .10	23.2 0.5	19.40 .11	13.7 0.4	46.90 .22	22.7 2.4	42.55 .13	51.2 0.0
18.5	18.22 +.05	23.8 +0.7	19.49 +.06	13.4 −0.2	47.07 +.11	25.2 +2.6	42.65 +.07	51.4 +0.3
28.5	18.24 −.01	24.6 0.9	19.52 +.01	13.3 0.0	47.12 .00	28.0 2.7	42.70 +.02	51.8 0.5
Mar. 10.5	18.21 .05	25.5 1.0	19.51 −.03	13.5 +0.2	47.07 −.10	30.7 2.7	42.70 −.02	52.4 0.7
20.4	18.13 .09	26.6 1.1	19.45 .07	13.8 0.4	46.92 .20	33.3 2.6	42.66 .06	53.2 0.8
30.4	18.02 .12	27.7 1.1	19.37 .10	14.3 0.5	46.68 .27	35.8 2.3	42.58 .09	54.1 0.9
Apr. 9.4	17.89 −.15	28.7 +1.0	19.26 −.12	14.9 +0.6	46.37 −.34	38.0 +2.0	42.47 −.12	55.0 +0.9
19.3	17.73 .16	29.7 0.9	19.13 .13	15.5 0.7	46.01 .38	39.8 1.6	42.34 .13	56.0 0.9
29.3	17.57 .16	30.6 0.8	18.99 .14	16.2 0.7	45.61 .41	41.2 1.2	42.20 .14	56.8 0.9
May 9.3	17.41 .16	31.3 0.7	18.85 .14	16.9 0.7	45.20 .42	42.2 0.7	42.06 .14	57.7 0.8
19.3	17.26 .15	31.9 0.5	18.72 .13	17.5 0.6	44.78 .41	42.6 +0.2	41.92 .14	58.4 0.7
29.2	17.12 −.13	32.3 +0.3	18.59 −.12	18.1 +0.6	44.38 −.39	42.6 −0.3	41.79 −.13	59.0 +0.5
June 8.2	16.99 .11	32.6 +0.1	18.48 .11	18.7 0.5	44.00 .36	42.1 0.8	41.67 .11	59.4 0.4
18.2	16.89 .09	32.6 0.0	18.38 .09	19.2 0.5	43.66 .31	41.1 1.2	41.56 .10	59.8 0.3
28.2	16.82 .06	32.5 −0.2	18.30 .07	19.6 0.4	43.38 .26	39.7 1.6	41.47 .08	60.0 +0.1
July 8.1	16.76 .04	32.2 0.4	18.25 .04	19.9 0.3	43.14 .20	37.9 2.0	41.41 .05	60.0 −0.1
18.1	16.74 −.01	31.7 −0.5	18.21 −.02	20.2 +0.2	42.97 −.14	35.8 −2.3	41.37 −.03	59.8 −0.2
28.1	16.75 +.02	31.1 0.7	18.20 .00	20.3 +0.1	42.87 −.07	33.3 2.6	41.35 −.01	59.6 0.4
Aug. 7.0	16.78 .05	30.3 0.9	18.22 +.03	20.3 −0.1	42.83 .00	30.6 2.8	41.35 +.02	59.1 0.5
17.0	16.85 .08	29.4 1.0	18.26 .06	20.2 0.2	42.86 +.07	27.7 3.0	41.39 .05	58.5 0.7
27.0	16.94 .11	28.3 1.2	18.33 .08	19.9 0.4	42.97 .14	24.6 3.1	41.45 .08	57.7 0.9
Sept. 6.0	17.07 +.14	27.0 −1.3	18.43 +.11	19.4 −0.6	43.15 +.21	21.5 −3.1	41.55 +.11	56.7 −1.1
15.9	17.23 .18	25.6 1.5	18.56 .15	18.7 0.8	43.40 .29	18.4 3.1	41.67 .14	55.6 1.2
25.9	17.42 .21	24.1 1.6	18.73 .18	17.8 1.0	43.72 .36	15.3 3.0	41.83 .18	54.2 1.4
Oct. 5.9	17.65 .24	22.4 1.7	18.92 .21	16.7 1.2	44.12 .43	12.3 2.9	42.02 .21	52.7 1.6
15.9	17.90 .27	20.7 1.8	19.15 .24	15.4 1.4	44.58 .49	9.5 2.7	42.25 .24	51.1 1.7
25.8	18.19 +.30	18.9 −1.8	19.40 +.27	14.0 −1.6	45.10 +.55	7.0 −2.4	42.51 +.27	49.3 −1.9
Nov. 4.8	18.51 .32	17.2 1.8	19.69 .30	12.3 1.7	45.68 .60	4.7 2.1	42.80 .30	47.5 1.9
14.8	18.84 .34	15.4 1.7	20.00 .31	10.6 1.8	46.30 .64	2.8 1.6	43.11 .32	45.6 1.8
24.7	19.19 .35	13.7 1.6	20.32 .32	8.8 1.8	46.96 .66	1.4 1.2	43.44 .34	43.7 1.8
Dec. 4.7	19.54 .35	12.2 1.4	20.64 .32	6.9 1.8	47.63 .67	0.5 0.7	43.78 .34	41.9 1.8
14.7	19.88 +.34	10.9 −1.2	20.96 +.32	5.2 −1.7	48.29 +.65	0.1 −0.1	44.12 +.33	40.2 −1.6
24.7	20.21 .31	9.9 0.9	21.27 .30	3.5 1.6	48.92 .61	0.2 +0.4	44.45 .32	38.8 1.3
34.6	20.51 +.28	9.1 −0.6	21.56 +.27	2.0 −1.4	49.52 +.56	0.9 +1.0	44.75 +.28	37.6 −1.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	9 Draconis (H.)		ρ Leonis.		η Argus.		l Leonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 10 25	° ′ +76 17	h m 10 26	° ′ + 9 53	h m 10 40	° ′ −59 4	h m 10 43	° ′ +11 8
	s	″	s	″	s	″	s	″
(Dec. 30.6)	23.60 +.96	38.8 +1.0	49.00 +.29	27.1 −1.7	40.51 +.44	54.9 −2.8	16.28 +.30	46.3 −1.7
Jan. 9.6	24.52 .86	40.0 1.5	49.27 .26	25.5 1.4	40.92 .38	57.9 3.1	16.57 .27	44.7 1.5
19.6	25.32 .73	41.7 2.0	49 52 .22	24.2 1.2	41.28 .32	61.2 3.4	16.82 .24	43.4 1.2
29.6	25.98 .57	43.9 2.5	49.72 .18	23.1 0 9	41.56 .24	64.7 3.6	17.04 .19	42.3 0.9
Feb. 8.5	26.47 .40	46.5 2.7	49.87 .13	22.3 0.7	41.76 .17	68.4 3.7	17.21 .15	41.6 0.6
18.5	26.78 +.22	49.4 +2 9	49.98 +.08	21.8 −0.4	41.88 +.09	72.1 −3.6	17.34 +.10	41.1 −0.3
28.5	26.90 +.03	52.4 3.0	50.04 +.04	21.6 −0.1	41.93 +.01	75.7 3.6	17.41 .05	40.9 −0.1
Mar. 10.5	26.84 −.15	55.4 3.0	50.05 −.01	21.6 +0.1	41.91 −.06	79.2 3.4	17.44 +.01	40.9 +0.2
20.4	26.60 .32	58.4 2.8	50.02 .05	21.7 0.3	41.81 .12	82.4 3.1	17.43 −.03	41.2 0.4
30.4	26.21 .46	61.1 2.6	49.96 .08	22.1 0.4	41.66 .18	85.4 2.8	17.38 .06	41.7 0.5
Apr. 9.4	25.68 −.58	63.5 +2.2	49.87 −.10	22.6 +0.5	41.46 −.23	88.0 −2.4	17.30 −.09	42.2 +0.6
19.4	25.05 .67	65.6 1.8	49.76 .12	23.2 0.6	41.21 .27	90.2 2.0	17.20 .11	42.9 0.7
29.3	24.33 .74	67.1 1.3	49.64 .13	23.8 0.7	40.92 .29	92.1 1.6	17.09 .12	43.6 0.7
May 9.3	23.57 .77	68.2 0.8	49.51 .13	24.5 0.7	40.62 .32	93.4 1.1	16.96 .13	44.4 0.7
19.3	22.79 .78	68.7 +0.2	49.38 .13	25.2 0.7	40.30 .33	94.3 0.6	16.84 .13	45.1 0.7
29.3	22.02 −.75	68.6 −0.3	49.25 −.12	25.9 +0.6	39.96 −.33	94.6 −0.1	16.71 −.12	45.8 +0.7
June 8.2	21.28 .71	68.0 0.8	49.14 .11	26.5 0.6	39.64 .32	94.5 +0.4	16.60 .11	46.5 0.6
18.2	20.60 .64	67.0 1.3	49.03 .10	27.1 0.6	39.32 .31	93.9 0.9	16.49 .10	47.1 0.6
28.2	20.00 .56	65.4 1.8	48.94 .08	27.6 0.5	39.01 .29	92.7 1.3	16.40 .09	47.6 0.5
July 8.1	19.48 .47	63.4 2.2	48.87 .06	28.1 0.4	38.73 .26	91.2 1.8	16.31 .07	48.0 0.4
18.1	19.07 −.36	60.9 −2.6	48.82 −.04	28.4 +0.3	38.49 −.23	89.2 +2.2	16.25 −.05	48.3 +0.3
28.1	18.77 .24	58.2 2.9	48.79 −.02	28.7 0.2	38.28 .16	86.9 2.5	16.21 .03	48.5 +0.1
Aug. 7.1	18.59 −.12	55.2 3.1	48.79 +.01	28.8 +0.1	38.12 .13	84.3 2.7	16.19 −.01	48.5 0.0
17.0	18.54 +.01	51.9 3.3	48.80 .03	28.8 −0.1	38.02 −.07	81.5 2.8	16.19 +.02	48.4 −0.2
27.0	18.61 .14	48.6 3.4	48.85 .06	28.6 0.3	37.99 .00	78.6 2.9	16.22 .04	48.2 0.4
Sept. 6.0	18.82 +.27	45.1 −3.5	48.92 +.09	28.2 −0 5	38.02 +.07	75.7 +2.8	16.28 +.07	47.7 −0.6
16.0	19.16 .40	41.7 3.4	49.03 .12	27.7 0.7	38.12 .14	72.9 2.7	16.37 .11	47.0 0.8
25.9	19.62 .53	38.2 3.3	49.17 .16	26.9 0.9	38.29 .21	70.4 2.4	16.49 .14	46.1 1.0
Oct. 5.9	20.21 .65	35.0 3.2	49.34 .19	25.8 1.1	38.54 .28	68.1 2.0	16.65 .18	45.0 1.2
15.9	20.92 .76	32.0 2.9	49.55 .22	24.6 1.4	38.86 .35	66.3 1.6	16.84 .21	43.7 1.4
25.8	21.74 +.87	29.2 −2.6	49.79 +.26	23.2 −1.6	39.24 +.41	65.0 +1.0	17.07 +.25	42.1 −1.6
Nov. 4.8	22.66 .96	26.8 2.2	50.06 .28	21.5 1.7	39.68 .46	64.2 +0.4	17.33 .28	40.4 1.8
14.8	23.66 1.03	24.9 1.7	50.35 .31	19.7 1.8	40.16 .49	64.1 −0.2	17.62 .30	38.6 1.9
24.7	24.71 1.07	23.4 1.2	50.67 .32	17.8 1.9	40.66 .51	64.6 0.8	17.93 .32	36.6 2.0
Dec. 4.7	25.80 1.08	22.5 −0.6	50.99 .33	15.9 1.9	41.18 .51	65.7 1.4	18.26 .33	34.6 2.0
14.7	26.88 1.07	22.1 0.0	51.32 +.32	14.0 −1.9	41.69 +.50	67.4 −2.0	18.59 +.33	32.7 −1.9
24.7	27.93 1.02	22.4 +0.6	51.64 .31	12.2 1.7	42.17 .46	69.7 2.5	18.91 .31	30.8 1.8
34.6	28.92 +.92	23.2 +1.2	51.93 +.28	10.5 −1.6	42.62 +.41	72.4 −2.9	19.21 +.29	29.1 −1.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Majoris.		δ Leonis.		δ Crateris.		τ Leonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	10h 56m	+62° 21′	11h 8m	+21° 8′	11h 13m	−14° 9′	11h 22m	+ 3° 28′
	s	″	s	″	s	″	s	″
(Dec.30.7)	41.00 +.56	39.8 −0.1	2.84 +.33	43.9 −1.5	39.01 +.30	40.4 −2.3	4.70 +.31	59.0 −1.9
Jan. 9.7	41.54 .52	40.1 +0.6	3.16 .30	42.6 1.2	39.30 .28	42.7 2.3	5.00 .29	57.1 1.8
19.6	42.03 .46	41.0 1.2	3.44 .27	41.6 0.8	39.57 .25	45.0 2.3	5.28 .26	55.3 1.6
29.6	42.45 .38	42.4 1.6	3.69 .23	40.9 0.5	39.81 .21	47.3 2.2	5.52 .22	53.8 1.4
Feb. 8.6	42.79 .29	44.3 2.1	3.90 .18	40.6 −0.1	40.00 .17	49.4 2.1	5.72 .18	52.5 1.1
18.5	43.03 +.20	46.5 +2.4	4.05 +.13	40.7 +0.2	40.14 +.12	51.4 −1.8	5.88 +.13	51.5 −0.9
28.5	43.18 .10	49.0 2.6	4.16 .08	41.1 0.5	40.24 .08	53.1 1.6	5.99 .09	50.8 0.6
Mar. 10.5	43.24 +.01	51.7 2.7	4.22 +.04	41.7 0.8	40.30 +.03	54.6 1.4	6.06 .05	50.4 0.3
20.5	43.20 −.08	54.4 2.7	4.23 −.01	42.6 0.9	40.31 .00	55.9 1.1	6.08 +.01	50.2 −0.1
30.4	43.08 .16	57.1 2.6	4.20 .04	43.6 1.1	40.29 −.04	56.9 0.9	6.07 −.03	50.2 +0.1
Apr. 9.4	42.88 −.23	59.6 +2.4	4.14 −.08	44.7 +1.1	40.24 −.07	57.7 −0.6	6.03 −.05	50.4 +0.3
19.4	42.62 .28	61.8 2.1	4.05 .10	45.9 1.1	40.16 .09	58.2 0.4	5.97 .08	50.8 0.4
29.4	42.32 .32	63.7 1.7	3.94 .11	47.0 1.1	40.06 .10	58.4 −0.2	5.88 .09	51.3 0.5
May 9.3	41.99 .34	65.2 1.3	3.82 .13	48.1 1.0	39.96 .11	58.5 +0.1	5.78 .10	51.8 0.6
19.3	41.64 .35	66.3 0.8	3.69 .13	49.0 0.9	39.84 .12	58.3 0.3	5.67 .11	52.5 0.7
29.3	41.29 −.35	66.9 +0.3	3.56 −.13	49.9 +0.8	39.72 −.12	57.9 +0.5	5.56 −.11	53.2 +0.7
June 8.2	40.94 .34	67.0 −0.1	3.44 .12	50.6 0.6	39.60 .12	57.4 0.6	5.44 .11	53.9 0.7
18.2	40.62 .31	66.6 0.6	3.32 .12	51.1 0.4	39.48 .12	56.6 0.8	5.33 .11	54.6 0.7
28.2	40.32 .28	65.8 1.1	3.20 .10	51.4 +0.2	39.36 .11	55.8 0.9	5.23 .10	55.3 0.7
July 8.2	40.06 .24	64.4 1.5	3.11 .09	51.6 0.0	39.26 .10	54.8 1.1	5.14 .09	55.9 0.6
18.1	39.83 −.20	62.8 −1.9	3.02 −.07	51.5 −0.1	39.17 −.08	53.7 +1.1	5.05 −.08	56.5 +0.5
28.1	39.66 .15	60.7 2.2	2.96 .05	51.3 0.4	39.10 .07	52.5 1.2	4.98 .06	57.0 0.5
Aug. 7.1	39.54 .09	58.3 2.5	2.92 .03	50.8 0.6	39.04 .05	51.3 1.2	4.93 .04	57.4 0.4
17.1	39.47 −.04	55.6 2.8	2.90 −.01	50.2 0.8	39.00 −.02	50.1 1.1	4.89 −.02	57.7 +0.2
27.0	39.46 +.03	52.6 3.0	2.90 +.02	49.3 1.0	38.99 .00	49.0 1.0	4.88 .00	57.8 0.0
Sept. 6.0	39.52 +.09	49.6 −3.1	2.93 +.05	48.2 −1.2	39.01 +.04	48.0 +0.9	4.90 +.03	57.8 −0.2
16.0	39.64 .16	46.4 3.2	3.00 .08	46.9 1.4	39.06 .07	47.2 0.7	4.95 .07	57.5 0.4
25.9	39.83 .22	43.1 3.3	3.10 .12	45.4 1.6	39.15 .11	46.6 0.4	5.03 .10	57.0 0.6
Oct. 5.9	40.09 .29	39.8 3.2	3.24 .16	43.7 1.8	39.28 .15	46.3 +0.1	5.15 .14	56.3 0.9
15.9	40.42 .36	36.7 3.1	3.42 .20	41.9 1.9	39.45 .19	46.4 −0.2	5.30 .18	55.3 1.1
25.9	40.81 +.42	33.7 −2.9	3.64 +.23	39.8 −2.1	39.66 +.23	46.8 −0.6	5.50 +.21	54.1 −1.4
Nov. 4.8	41.27 .48	30.9 2.6	3.89 .27	37.7 2.1	39.90 .26	47.5 0.9	5.73 .25	52.6 1.6
14.8	41.78 .53	28.4 2.3	4.18 .30	35.6 2.2	40.18 .29	48.6 1.3	6.00 .28	50.9 1.8
24.8	42.33 .57	26.3 1.9	4.49 .32	33.4 2.1	40.48 .31	50.0 1.6	6.29 .30	49.0 2.0
Dec. 4.8	42.91 .59	24.6 1.4	4.82 .34	31.3 2.0	40.80 .33	51.8 1.9	6.61 .32	47.0 2.0
14.7	43.51 +.60	23.5 −0.9	5.17 +.34	29.3 −1.9	41.13 +.33	53.8 −2.1	6.93 +.32	44.9 −2.1
24.7	44.10 .58	22.9 −0.3	5.51 .34	27.6 1.6	41.46 .32	55.6 2.3	7.26 .32	42.8 2.0
34.7	44.67 +.55	22.9 +0.3	5.84 +.32	26.1 −1.3	41.77 +.30	58.3 −2.3	7.57 +.30	40.8 −1.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	λ Draconis.		υ Leonis.		β Leonis.		γ Ursæ Majoris.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 11 24	° ′ +69 56	h m 11 31	° ′ − 0 11	h m 11 43	° ′ +15 12	h m 11 47	° ′ +54 19
	s	″	s	″	s	″	s	″
(Dec. 30.7)	36.79 +.75	77.3 −0.1	6.94 +.32	41.7 −2.1	14.66 +.32	27.1 −1.8	49.36 +.48	26.1 −0.8
Jan. 9.7	37.52 .70	77.6 +0.5	7.24 .29	43.7 2.0	14.98 .31	25.4 1.5	49.83 .46	25.5 −0.3
19.7	38.19 .63	78.4 1.1	7.52 .26	45.6 1.8	15.27 .28	24.0 1.2	50.28 .43	25.6 +0.3
29.6	38.78 .54	79.8 1.7	7.77 .23	47.3 1.6	15.54 .24	23.0 0.9	50.68 .38	26.2 0.8
Feb. 8.6	39.28 .44	81.7 2.1	7.97 .18	48.7 1.3	15.76 .20	22.2 0.6	51.03 .32	27.3 1.4
18.6	39.66 +.32	84.1 +2.5	8.14 +.14	50.0 −1.1	15.94 +.16	21.8 −0.2	51.31 +.25	28.9 +1.8
28.5	39.92 .20	86.8 2.8	8.26 .10	50.9 0.8	16.08 .11	21.8 +0.1	51.52 .17	30.9 2.1
Mar. 10.5	40.05 +.07	89.6 2.9	8.33 .06	51.6 0.5	16.17 .07	22.0 0.4	51.65 .10	33.1 2.4
20.5	40.06 −.05	92.6 3.0	8.37 +.02	52.0 0.3	16.22 +.03	22.5 0.7	51.72 +.03	35.6 2.6
30.5	39.95 .16	95.5 2.9	8.37 −.02	52.2 −0.1	16.23 −.01	23.3 0.8	51.71 −.04	38.2 2.6
Apr. 9.4	39.74 −.26	98.3 +2.7	8.34 −.05	52.2 +0.1	16.20 −.04	24.1 +0.9	51.64 −.10	40.8 +2.5
19.4	39.43 .35	100.9 2.4	8.28 .07	52.0 0.3	16.15 .07	25.1 1.0	51.51 .15	43.3 2.4
29.4	39.05 .41	103.1 2.0	8.20 .09	51.7 0.4	16.07 .09	26.2 1.0	51.34 .19	45.5 2.1
May 9.3	38.61 .46	104.9 1.6	8.10 .10	51.2 0.5	15.98 .10	27.2 1.0	51.14 .22	47.5 1.8
19.3	38.12 .49	106.2 1.1	8.00 .11	50.7 0.6	15.87 .11	28.2 1.0	50.91 .24	49.1 1.4
29.3	37.62 −.51	107.0 +0.6	7.89 −.11	50.1 +0.7	15.76 −.12	29.1 +0.9	50.66 −.26	50.3 +1.0
June 8.3	37.12 .50	107.3 0.0	7.78 .11	49.4 0.7	15.64 .12	30.0 0.8	50.40 .26	51.1 0.6
18.2	36.62 .48	107.1 −0.5	7.67 .11	48.7 0.7	15.52 .12	30.6 0.6	50.15 .25	51.5 +0.1
28.2	36.16 .45	106.4 1.0	7.56 .10	48.0 0.7	15.41 .11	31.2 0.5	49.90 .24	51.4 −0.3
July 8.2	35.72 .41	105.1 1.5	7.46 .09	47.3 0.7	15.30 .10	31.6 0.3	49.66 .23	50.9 0.8
18.2	35.34 −.36	103.4 −1.9	7.38 −.08	46.6 +0.7	15.20 −.09	31.9 +0.2	49.45 −.20	49.9 −1.2
28.1	35.01 .30	101.3 2.3	7.30 .07	45.9 0.6	15.11 .08	31.9 0.0	49.26 .17	48.5 1.6
Aug. 7.1	34.75 .23	98.8 2.7	7.24 .05	45.4 0.5	15.04 .06	31.8 −0.2	49.10 .14	46.7 2.0
17.1	34.56 .15	95.9 3.0	7.19 .03	44.9 0.4	14.99 .04	31.5 0.4	48.98 .10	44.6 2.3
27.0	34.45 −.07	92.8 3.2	7.17 −.01	44.6 0.3	14.96 −.02	31.0 0.6	48.90 .06	42.1 2.6
Sept. 6.0	34.42 +.02	89.5 −3.4	7.18 +.02	44.4 +0.1	14.95 +.01	30.2 −0.9	48.86 −.01	39.4 −2.8
16.0	34.48 .11	86.1 3.5	7.22 .05	44.4 −0.1	14.98 .04	29.3 1.1	48.87 +.04	36.4 3.0
26.0	34.64 .20	82.5 3.6	7.29 .09	44.7 0.4	15.04 .08	28.1 1.3	48.94 .09	33.3 3.2
Oct. 5.9	34.89 .30	79.0 3.5	7.40 .13	45.2 0.7	15.14 .12	26.6 1.5	49.06 .15	30.1 3.3
15.9	35.23 .39	75.5 3.4	7.55 .17	46.0 0.9	15.28 .16	25.0 1.7	49.25 .22	26.8 3.3
25.9	35.67 +.48	72.2 −3.2	7.74 +.21	47.1 −1.2	15.46 +.20	23.2 −1.9	49.49 +.28	23.5 −3.2
Nov. 4.9	36.19 .57	69.1 2.9	7.96 .24	48.4 1.5	15.67 .24	21.2 2.1	49.80 .33	20.4 3.1
14.8	36.80 .64	66.4 2.5	8.22 .27	50.0 1.7	15.93 .27	19.0 2.2	50.16 .39	17.4 2.9
24.8	37.47 .70	64.0 2.1	8.51 .30	51.8 1.9	16.22 .30	16.8 2.2	50.57 .43	14.7 2.5
Dec. 4.8	38.20 .75	62.1 1.6	8.82 .32	53.8 2.0	16.53 .32	14.6 2.2	51.02 .46	12.4 2.1
14.7	38.96 +.77	60.8 −1.1	9.15 +.33	55.8 −2.1	16.86 +.33	12.5 −2.1	51.50 +.49	10.4 −1.7
24.7	39.73 .76	60.0 −0.5	9.47 .32	57.9 2.1	17.19 .33	10.4 1.9	51.99 .49	9.0 1.2
34.7	40.49 +.74	59.9 +0.1	9.79 +.31	60.0 −2.1	17.52 +.32	8.6 −1.8	52.48 +.48	8.1 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ο Virginis.		4 Draconis (H.)		γ Corvi.		β Chamæleontis	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 11 59	° ′ + 9 21	h m 12 6	° ′ +78 14	h m 12 9	° ′ −16 54	h m 12 11	° ′ −78 40
	s	″	s	″	s	″	s	″
(Dec.30.7)	24.06 +.32	54.5 −2.0	48.85 1.20	40.3 −0.4	56.85 +.33	26.1 −2.1	44.49 1.21	23.2 −1.4
Jan. 9.7	24.38 .31	52.7 1.8	50.04 1.17	40.2 +0.2	57.17 .31	28.3 2.2	45.67 1.13	24.9 1.9
19.7	24.68 .28	51.0 1.5	51.18 1.10	40.8 0.9	57.47 .29	30.6 2.3	46.76 1.03	27.2 2.5
29.6	24.95 .25	49.7 1.2	52.23 .99	41.9 1.5	57.75 .26	32.8 2.2	47.74 .91	29.9 2.9
Feb. 8.6	25.18 .21	48.6 0.9	53.15 .85	43.7 2.0	57.99 .22	35.0 2.1	48.58 .76	33.0 3.2
18.6	25.37 +.17	47.9 −0.6	53.91 +.68	45.9 +2.5	58.19 +.18	37.1 −1.9	49.26 +.60	36.4 −3.5
28.6	25.52 .13	47.5 −0.3	54.49 .48	48.6 2.8	58.35 .14	38.9 1.8	49.79 .44	40.0 3.7
Mar. 10.5	25.62 .09	47.3 0.0	54.88 .28	51.5 3.0	58.46 .10	40.6 1.6	50.14 .27	43.7 3.8
20.5	25.69 .05	47.5 +0.3	55.06 +.08	54.6 3.1	58.54 .06	42.1 1.3	50.33 +.10	47.5 3.8
30.5	25.72 +.01	47.9 0.5	55.03 −.12	57.8 3.1	58.58 +.02	43.2 1.1	50.34 −.07	51.2 3.7
Apr. 9.5	25.71 −.02	48.4 +0.7	54.81 −.31	60.8 +3.0	58.58 −.01	44.2 −0.9	50.19 −.22	54.8 −3.5
19.4	25.67 .05	49.2 0.8	54.42 .48	63.7 2.7	58.56 .04	45.0 0.6	49.89 .37	58.2 3.3
29.4	25.61 .07	50.0 0.8	53.86 .62	66.3 2.4	58.51 .06	45.5 0.4	49.44 .51	61.4 3.0
May 9.4	25.53 .09	50.8 0.9	53.18 .74	68.5 2.0	58.43 .08	45.8 −0.2	48.87 .63	64.2 2.6
19.3	25.44 .10	51.7 0.9	52.40 .82	70.2 1.5	58.35 .09	45.9 0.0	48.18 .74	66.6 2.2
29.3	25.34 −.11	52.6 +0.9	51.54 −.88	71.4 +1.0	58.25 −.10	45.7 +0.2	47.39 −.83	68.5 −1.7
June 8.3	25.23 .11	53.4 0.8	50.64 .92	72.1 +0.4	58.14 .11	45.4 0.4	46.52 .90	70.0 1.2
18.3	25.12 .11	54.2 0.7	49.72 .92	72.3 −0.1	58.03 .12	45.0 0.6	45.59 .95	70.9 0.7
28.2	25.01 .11	54.8 0.6	48.81 .90	71.9 0.7	57.91 .12	44.3 0.7	44.63 .97	71.3 −0.1
July 8.2	24.90 .11	55.4 0.5	47.93 .86	70.9 1.2	57.79 .12	43.5 0.8	43.66 .96	71.2 +0.4
18.2	24.80 −.10	55.8 +0.4	47.10 −.79	69.4 −1.7	57.67 −.11	42.6 +1.0	42.71 −.96	70.5 +1.0
28.2	24.70 .09	56.1 0.2	46.35 .71	67.5 2.2	57.56 .10	41.6 1.1	41.80 .87	69.2 1.5
Aug. 7.1	24.62 .07	56.3 +0.1	45.70 .61	65.1 2.6	57.46 .09	40.5 1.1	40.97 .78	67.5 2.0
17.1	24.56 .05	56.3 −0.1	45.14 .49	62.3 2.9	57.38 .07	39.4 1.1	40.25 .66	65.3 2.4
27.1	24.51 −.03	56.1 0.3	44.71 .36	59.2 3.2	57.32 .05	38.3 1.1	39.66 .51	62.8 2.7
Sept. 6.0	24.50 .00	55.7 −0.5	44.42 −.22	55.8 −3.5	57.28 −.02	37.3 +1.0	39.23 −.34	59.9 +2.9
16.0	24.50 +.03	55.1 0.7	44.26 −.08	52.2 3.7	57.27 +.01	36.4 0.8	38.98 −.15	56.9 3.0
26.0	24.55 .06	54.2 1.0	44.26 +.08	48.5 3.8	57.31 .05	35.6 0.6	38.94 +.06	53.8 3.1
Oct. 6.0	24.63 .10	53.1 1.2	44.42 .24	44.8 3.8	57.38 .09	35.1 0.4	39.10 .27	50.8 3.0
15.9	24.75 .14	51.8 1.4	44.75 .41	41.0 3.7	57.49 .14	34.9 +0.1	39.47 .47	47.9 2.8
25.9	24.91 +.18	50.3 −1.7	45.24 +.57	37.4 −3.5	57.65 +.18	35.0 −0.3	40.04 +.67	45.3 +2.4
Nov. 4.9	25.12 .22	48.5 1.9	45.89 .73	34.0 3.3	57.86 .22	35.5 0.6	40.80 .84	43.1 2.0
14.9	25.36 .26	46.5 2.0	46.69 .87	30.9 3.0	58.10 .26	36.3 1.0	41.73 .99	41.3 1.5
24.8	25.64 .29	44.5 2.1	47.63 1.00	28.1 2.5	58.38 .29	37.4 1.4	42.79 1.11	40.1 0.9
Dec. 1.8	25.94 .31	42.3 2.2	48.68 1.10	25.8 2.0	58.69 .32	38.9 1.6	43.95 1.19	39.5 +0.3
14.8	26.26 +.32	40.1 −2.1	49.82 1.17	24.1 −1.5	59.02 +.33	40.7 −1.9	45.16 1.22	39.6 −0.4
24.7	26.59 .33	38.0 2.0	51.01 1.21	22.9 0.9	59.35 .33	42.6 2.1	46.39 1.21	40.3 1.0
34.7	26.91 +.32	36.0 −1.9	52.22 1.20	22.4 −0.2	59.69 +.33	44.8 −2.2	47.59 1.18	41.6 −1.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Virginis.		α¹ Crucis.		β Corvi.		κ Draconis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 12 14	° ′ − 0 1	h m 12 20	° ′ −62 27	h m 12 28	° ′ −22 45	h m 12 28	° ′ +70 24
	s	″	s	″	s	″	s	″
(Dec.30.7)	4.40 +.32	59.5 −2.1	16.29 +.58	42.7 −1.6	24.14 +.34	49.6 −2.1	35.06 +.76	42.6 −0.9
Jan. 9.7	4.71 .31	61.5 2.0	16.85 .55	44.5 2.1	24.47 .33	51.7 2.2	35.82 .75	42.0 −0.3
19.7	5.01 .29	63.5 1.8	17.38 .50	46.9 2.5	24.80 .31	54.0 2.3	36.56 .72	42.0 +0.3
29.7	5.29 .26	65.2 1.6	17.86 .45	49.7 2.9	25.09 .28	56.3 2.3	37.26 .66	42.7 1.0
Feb. 8.6	5.52 .22	66.7 1.4	18.28 .38	52.7 3.2	25.35 .24	58.7 2.3	37.88 .58	43.9 1.5
18.6	5.73 +.18	68.0 −1.1	18.63 +.31	56.0 −3.3	25.57 +.20	60.9 −2.2	38.41 +.48	45.8 +2.0
28.6	5.89 .14	68.9 0 8	18.90 .24	59.4 3.5	25.75 .16	63.0 2.0	38.84 .37	48.1 2.5
Mar. 10.5	6.01 .10	69.6 0.6	19.10 .16	62.9 3.5	25.89 .12	65.0 1.9	39.15 .25	50.7 2.8
20.5	6.09 .06	70.0 0.3	19.23 .09	66.4 3.4	25.99 .08	66.8 1.7	39.33 .13	53.6 3.0
30.5	6.13 +.03	70.2 −0.1	19.28 +.02	69.8 3.3	26.04 .04	68.3 1.4	39.40 +.01	56.7 3.0
Apr. 9.5	6.14 −.01	70.2 +0.1	19.27 −.05	73.0 −3.1	26.07 +.01	69.6 −1.2	39.35 −.11	59.7 +3.0
19.4	6.12 .03	70.0 0.3	19.19 .11	75.9 2.9	26.06 −.02	70.7 1.0	39.18 .21	62.7 2.8
29.4	6.07 .05	69.6 0.4	19.05 .16	78.6 2.5	26.03 .05	71.5 0.7	38.92 .30	65.4 2.6
May 9.4	6.01 .07	69.1 0.5	18.86 .21	81.0 2.1	25.97 .07	72.2 0.5	38.58 .38	67.8 2.2
19.4	5.93 .09	68.5 0.6	18.63 .25	83.0 1.8	25.89 .09	72.5 −0.3	38.17 .44	69.9 1.8
29.3	5.83 −.10	67.9 +0.7	18.35 −.29	84.5 −1.3	25.80 −.10	72.7 0.0	37.70 −.48	71.5 +1.4
June 8.3	5.74 .10	67.2 0.7	18.05 .32	85.6 0.9	25.69 .11	72.6 +0.2	37.20 .51	72.6 0.8
18.3	5.63 .11	66.5 0.7	17.72 .34	86.3 −0.4	25.57 .12	72.3 0.4	36.68 .52	73.1 +0.3
28.2	5.52 .11	65.8 0.7	17.37 .35	86.4 +0.1	25.45 .13	71.8 0.6	36.16 .52	73.2 −0.2
July 8.2	5.41 .11	65.1 0.7	17.01 .35	86.1 0.6	25.32 .13	71.1 0.8	35.64 .51	72.7 0.7
18.2	5.31 −.10	64.5 +0.6	16.66 −.35	85.2 +1.1	25.19 −.13	70.3 +1.0	35.15 −.48	71.7 −1.3
28.2	5.21 .09	63.9 0.6	16.32 .33	83.9 1.5	25.06 .12	69.2 1.1	34.68 .44	70.2 1.7
Aug. 7.1	5.12 .08	63.4 0.5	16.01 .30	82.2 1.9	24.95 .11	68.1 1.2	34.26 .39	68.2 2.2
17.1	5.04 .07	63.0 0.3	15.73 .25	80.1 2.2	24.84 .09	66.8 1.3	33.90 .33	65.8 2.6
27.1	4.98 .04	62.7 +0.2	15.50 .20	77.7 2.5	24.76 .07	65.6 1.3	33.60 .26	63.0 2.9
Sept. 6.1	4.95 −.02	62.5 0.0	15.34 −.13	75.1 +2.7	24.70 −.04	64.3 +1.2	33.37 −.18	60.0 −3.2
16.0	4.95 +.01	62.6 −0.2	15.25 −.05	72.4 2.7	24.68 −.01	63.1 1.1	33.23 −.10	56.6 3.4
26.0	4.98 .05	62.9 0.4	15.24 +.04	69.6 2.7	24.69 +.03	62.1 1.0	33.18 .00	53.1 3.6
Oct. 6.0	5.04 .09	63.4 0.7	15.32 .12	66.9 2.6	24.74 .08	61.2 0.7	33.22 +.10	49.4 3.7
15.9	5.15 .13	64.2 0.9	15.49 .22	64.5 2.3	24.84 .12	60.7 0.4	33.37 .20	45.7 3.7
25.9	5.30 +.17	65.3 −1.2	15.75 +.30	62.3 +2.0	24.99 +.17	60.4 +0.1	33.63 +.31	42.0 −3.6
Nov. 4.9	5.49 .21	66.6 1.4	16.09 .38	60.5 1.5	25.19 .22	60.4 −0.2	33.98 .41	38.4 3.5
14.9	5.72 .25	68.1 1.7	16.52 .46	59.2 1.0	25.43 .26	60.9 0.6	34.45 .51	35.0 3.2
24.8	5.99 .28	69.9 1.9	17.01 .51	58.4 +0.5	25.70 .29	61.7 1.0	35.00 .60	32.0 2.9
Dec. 4.8	6.28 .30	71.9 2.0	17.55 .55	58.2 −0.1	26.01 .32	62.9 1.3	35.64 .67	29.3 2.4
14.8	6.60 +.32	73.9 −2.1	18.12 +.58	58.7 −0.7	26.34 +.34	64.4 −1.7	36.34 +.72	27.1 −1.9
24.8	6.92 .32	76.1 2.1	18.70 .58	59.7 1.3	26.69 .34	66.2 1.9	37.09 .76	25.5 1.3
34.7	7.25 +.33	78.2 −2.0	19.27 +.57	61.2 −1.8	27.03 +.33	68.3 −2.1	37.86 +.77	24.4 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	32^{3} Camelop. (H.)		α Can. Venaticorum.		θ Virginis.		α Virginis. (*Spica.*)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	$12^{h}\ 48^{m}$	$+84^{\circ}\ 1'$	$12^{h}\ 50^{m}$	$+38^{\circ}\ 55'$	$13^{h}\ 4^{m}$	$-\ 4^{\circ}\ 55'$	$13^{h}\ 19^{m}$	$-10^{\circ}\ 33'$
	s	″	s	″	s	″	s	″
(Dec.30.8)	11.18+2.20	39.8 −0.9	40.93 +.38	52.2 −1.8	2.57 +.32	44.6 −2.0	10.95 +.32	51.2 −1.9
Jan. 9.7	13.40 2.21	39.2 −0.2	41.32 .38	50.6 1.4	2.90 .31	46.7 2.0	11.27 .32	53.2 2.0
19.7	15.60 2.16	39.4 +0.5	41.69 .36	49.5 0.8	3.21 .30	48.7 1.9	11.59 .31	55.2 2.0
29.7	17.71 2.02	40.2 1.1	42.04 .34	48.9 −0.3	3.51 .28	50.5 1.8	11.90 .29	57.1 1.9
Feb. 8.6	19.65 1.82	41.6 1.7	42.36 .30	48.9 +0.3	3.78 .26	52.2 1.6	12.18 .26	58.9 1.7
18.6	21.35+1.54	43.5 +2.2	42.65 +.26	49.4 +0.7	4.02 +.22	53.7 −1.3	12.43 +.23	60.6 −1.6
28.6	22.74 1.21	46.0 2.6	42.88 .21	50.3 1.2	4.22 .19	54.9 1.1	12.65 .20	62.0 1.3
Mar. 10.6	23.78 .85	48.8 3.0	43.07 .16	51.7 1.5	4.39 .15	55.9 0.8	12.83 .16	63.3 1.1
20.5	24.45 .47	51.8 3.1	43.20 .11	53.4 1.9	4.52 .11	56.6 0.6	12.97 .13	64.3 0.9
30.5	24.72+ .08	55.0 3.2	43.28 .06	55.4 2.1	4.61 .08	57.1 0.3	13.09 .09	65.1 0.7
Apr. 9.5	24.61− .30	58.2 +3.1	43.32 +.01	57.6 +2.2	4.67 +.05	57.3 −0.1	13.16 +.06	65.6 −0.5
19.5	24.11 .66	61.2 2.9	43.31 −.03	59.8 2.2	4.70 +.02	57.3 0.0	13.21 +.03	66.0 0.3
29.4	23.28 .99	64.1 2.7	43.26 .06	62.0 2.2	4.70 −.01	57.2 +0.2	13.22 .00	66.2 −0.1
May 9.4	22.13 1.28	66.6 2.3	43.18 .09	64.2 2.0	4.68 .03	56.9 0.3	13.22 −.02	66.2 0.0
19.4	20.72 1.52	68.7 1.9	43.08 .12	66.1 1.8	4.64 .05	56.5 0.4	13.19 .04	66.1 +0.2
29.3	19.10−1.70	70.3 +1.4	42.94 −.14	67.8 +1.6	4.57 −.07	56.0 +0.5	13.14 −.06	65.8 +0.3
June 8.3	17.32 1.83	71.4 0.8	42.80 .16	69.3 1.3	4.50 .09	55.4 0.6	13.06 .08	65.5 0.4
18.3	15.44 1.90	72.0 +0.3	42.63 .17	70.4 0.9	4.40 .10	54.8 0.6	12.98 .10	65.0 0.5
28.3	13.52 1.93	71.9 −0.3	42.46 .17	71.1 0.6	4.30 .11	54.2 0.7	12.88 .11	64.5 0.6
July 8.2	11.59 1.90	71.4 0.8	42.29 .17	71.5 +0.2	4.19 .11	53.5 0.7	12.76 .12	63.9 0.6
18.2	9.72−1.83	70.3 −1.4	42.12 −.17	71.5 −0.2	4.07 −.12	52.9 +0.7	12.64 −.12	63.2 +0.7
28.2	7.94 1.71	68.7 1.8	41.95 .16	71.1 0.6	3.95 .12	52.2 0.6	12.52 .13	62.5 0.7
Aug. 7.2	6.30 1.55	66.6 2.3	41.79 .15	70.4 0.9	3.84 .11	51.6 0.6	12.39 .13	61.8 0.7
17.1	4.83 1.37	64.0 2.7	41.65 .13	69.2 1.3	3.73 .10	51.1 0.5	12.27 .12	61.1 0.7
27.1	3.57 1.14	61.1 3.1	41.53 .11	67.8 1.6	3.63 .09	50.6 0.4	12.16 .10	60.5 0.6
Sept. 6.1	2.53− .90	57.9 −3.4	41.43 −.08	65.9 −2.0	3.55 −.07	50.2 +0.3	12.07 −.08	59.9 +0.5
16.0	1.77 .62	54.4 3.6	41.37 −.04	63.8 2.3	3.50 −.04	50.1 +0.1	12.00 .05	59.4 0.3
26.0	1.29 .33	50.7 3.7	41.34 .00	61.4 2.5	3.48 .00	50.1 −0.1	11.97 −.02	59.1 +0.2
Oct. 6.0	1.11− .01	46.9 3.8	41.36 +.04	58.7 2.7	3.50 +.04	50.3 0.3	11.97 +.02	59.0 0.0
16.0	1.26+ .31	43.1 3.8	41.43 .09	55.9 2.9	3.56 .08	50.7 0.6	12.01 .07	59.1 −0.2
25.9	1.74+ .64	39.3 −3.7	41.55 +.15	52.9 −3.0	3.66 +.13	51.5 −0.9	12.10 +.11	59.5 −0.5
Nov. 4.9	2.54 .97	35.7 3.5	41.72 .20	49.8 3.1	3.81 .17	52.5 1.1	12.24 .16	60.1 0.8
14.9	3.67 1.28	32.3 3.2	41.94 .25	46.7 3.1	4.00 .21	53.7 1.4	12.42 .20	61.0 1.1
24.9	5.10 1.56	29.2 2.9	42.21 .29	43.7 2.9	4.24 .25	55.2 1.6	12.66 .24	62.2 1.3
Dec. 4.8	6.80 1.82	26.5 2.4	42.53 .32	40.8 2.7	4.51 .28	56.9 1.8	12.92 .28	63.7 1.6
14.8	8.73+2.02	24.4 −1.9	42.88 +.36	38.2 −2.5	4.81 +.31	58.8 −1.9	13.21 +.30	65.3 −1.8
24.8	10.83 2.16	22.8 1.3	43.25 .38	35.9 2.1	5.12 .32	60.8 2.0	13.53 .32	67.2 1.9
34.7	13.04+2.23	21.8 −0.7	43.64 +.39	34.0 −1.6	5.45 +.32	62.9 −2.1	13.86 +.33	69.1 −2.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Virginis.		η Ursæ Majoris.		η Bootis.		β Centauri.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 13 28	° ′ − 0 0	h m 13 43	° ′ +49 52	h m 13 49	° ′ +18 57	h m 13 55	° ′ −59 48
	s	″	s	″	s	″	s	″
(Dec. 30.8)	52.60 +.32	42.6 −2.1	1.51 +.41	46.0 −2.2	14.62 +.32	68.1 −2.3	46.79 +.54	59.4 −0.4
Jan. 9.8	52.92 .32	44.6 2.0	1.94 .43	44.1 1.7	14.94 .33	65.9 2.0	47.34 .55	60.1 0.9
19.7	53.23 .31	46.6 1.8	2.37 .43	42.7 1.1	15.27 .32	64.1 1.7	47.90 .55	61.3 1.4
29.7	53.54 .29	48.3 1.6	2.79 .41	41.9 −0.5	15.59 .31	62.6 1.3	48.44 .53	62.9 1.8
Feb. 8.7	53.82 .27	49.9 1.4	3.20 .39	41.7 +0.1	15.89 .29	61.5 0.9	48.96 .49	65.0 2.2
18.7	54.07 +.24	51.1 −1.1	3.57 +.35	42.2 +0.7	16.17 +.26	60.8 −0.4	49.43 +.45	67.3 −2.5
28.6	54.29 .20	52.1 0.8	3.90 .30	43.2 1.3	16.42 .23	60.6 0.0	49.86 .40	69.9 2.7
Mar. 10.6	54.48 .17	52.8 0.6	4.18 .25	44.7 1.7	16.63 .19	60.8 +0.4	50.23 .34	72.7 2.9
20.6	54.63 .13	53.3 −0.3	4.40 .19	46.7 2.1	16.80 .16	61.3 0.7	50.55 .28	75.6 2.9
30.5	54.75 .10	53.4 0.0	4.56 .14	49.0 2.4	16.94 .12	62.2 1.0	50.80 .22	78.6 3.0
Apr. 9.5	54.83 +.07	53.3 +0.2	4.67 +.08	51.6 +2.6	17.04 +.08	63.4 +1.3	51.00 +.16	81.6 −3.0
19.5	54.89 .04	53.0 0.4	4.72 +.02	54.3 2.7	17.11 .05	64.8 1.4	51.13 .10	84.5 2.9
29.5	54.91 +.01	52.6 0.5	4.72 −.03	57.0 2.7	17.15 +.02	66.3 1.6	51.21 +.04	87.3 2.7
May 9.4	54.91 −.01	52.0 0.6	4.66 .07	59.7 2.6	17.15 −.01	67.9 1.6	51.22 −.01	89.9 2.5
19.4	54.88 .04	51.3 0.7	4.57 .11	62.2 2.4	17.13 .04	69.5 1.6	51.18 .07	92.4 2.3
29.4	54.83 −.06	50.6 +0.7	4.44 −.15	64.5 +2.1	17.08 −.06	71.0 +1.5	51.08 −.12	94.5 −2.0
June 8.4	54.77 .07	49.8 0.8	4.27 .18	66.5 1.8	17.01 .08	72.4 1.4	50.93 .17	96.4 1.7
18.3	54.69 .09	49.1 0.7	4.08 .21	68.1 1.4	16.92 .10	73.7 1.2	50.74 .22	97.8 1.3
28.3	54.59 .10	48.4 0.7	3.86 .22	69.3 1.0	16.82 .11	74.8 1.0	50.50 .26	99.0 0.9
July 8.3	54.48 .11	47.6 0.7	3.63 .24	70.1 0.5	16.70 .13	75.7 0.8	50.22 .29	99.6 −0.5
18.2	54.36 −.12	47.0 +0.6	3.38 −.25	70.4 +0.1	16.56 −.14	76.3 +0.5	49.91 −.32	99.8 0.0
28.2	54.24 .12	46.4 0.5	3.13 .25	70.2 −0.4	16.42 .14	76.7 +0.3	49.59 .33	99.7 +0.4
Aug. 7.2	54.11 .12	46.0 0.4	2.89 .24	69.6 0.8	16.28 .14	76.9 0.0	49.25 .33	99.0 0.9
17.2	53.99 .12	45.6 0.3	2.65 .23	68.6 1.3	16.14 .14	76.7 −0.3	48.93 .31	97.9 1.3
27.1	53.88 .10	45.3 +0.2	2.43 .21	67.0 1.7	16.00 .13	76.3 0.6	48.61 .29	96.5 1.6
Sept. 6.1	53.78 −.08	45.2 0.0	2.23 −.18	65.1 −2.1	15.88 −.11	75.6 −0.8	48.34 −.26	94.6 +2.0
16.1	53.71 .06	45.3 −0.2	2.07 .14	62.8 2.5	15.78 .09	74.6 1.1	48.11 .20	92.5 2.2
26.1	53.66 −.03	45.6 0.4	1.95 .10	60.2 2.8	15.71 .05	73.4 1.4	47.93 .13	90.2 2.4
Oct. 6.0	53.65 +.01	46.1 0.6	1.87 −.05	57.2 3.1	15.68 −.02	71.8 1.7	47.84 −.06	87.8 2.4
16.0	53.69 .05	46.8 0.9	1.85 +.01	54.0 3.3	15.68 +.03	70.0 1.9	47.82 +.03	85.3 2.4
26.0	53.76 +.10	47.8 −1.1	1.90 +.07	50.6 −3.4	15.73 +.07	67.9 −2.2	47.89 +.12	82.9 +2.3
Nov. 5.0	53.89 .15	49.0 1.4	2.00 .14	47.1 3.5	15.82 .12	65.6 2.4	48.06 .21	80.8 2.1
14.9	54.05 .19	50.5 1.6	2.17 .20	43.6 3.5	15.97 .17	63.2 2.5	48.31 .30	78.8 1.7
24.9	54.27 .23	52.2 1.8	2.41 .26	40.1 3.4	16.16 .22	60.6 2.6	48.65 .38	77.3 1.3
Dec. 4.9	54.52 .27	54.1 1.9	2.70 .32	36.8 3.2	16.40 .26	58.0 2.6	49.06 .44	76.2 0.9
14.8	54.80 +.30	56.1 −2.0	3.05 +.37	33.7 −2.9	16.68 +.29	55.3 −2.6	49.53 +.50	75.5 +0.4
24.8	55.11 .31	58.2 2.1	3.44 .40	31.0 2.5	16.98 .31	52.8 2.4	50.05 .53	75.4 −0.1
34.8	55.43 +.32	60.3 −2.1	3.86 +.43	28.7 −2.0	17.30 +.33	50.5 −2.2	50.60 +.55	75.8 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Draconis.		*α* Bootis. (*Arcturus.*)		*θ* Bootis.		*ρ* Bootis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 14 1	° ′ +64 54	h m 14 10	° ′ +19 46	h m 14 21	° ′ +52 22	h m 14 26	° ′ +30 52
	s	″	s	″	s	″	s	″
(Dec. 30.8)	15.80 +.55	62.9 −2.2	26.80 +.31	33.1 −2.4	17.24 +.40	31.6 −2.5	53.90 +.31	15.9 −2.5
Jan. 9.8	16.38 .59	60.9 1.6	27.12 .32	30.8 2.1	17.66 .43	29.3 2.0	54.23 .34	13.6 2.2
19.8	16.98 .60	59.6 1.0	27.44 .32	28.8 1.8	18.09 .44	27.5 1.5	54.57 .34	11.6 1.8
29.7	17.58 .59	59.0 −0.3	27.76 .31	27.2 1.4	18.54 .44	26.4 0.9	54.91 .34	10.1 1.3
Feb. 8.7	18.17 .57	59.0 +0.3	28.07 .30	26.0 1.0	18.97 .42	25.8 −0.2	55.24 .32	9.0 0.8
18.7	18.71 +.52	59.6 +1.0	28.35 +.27	25.2 −0.6	19.38 +.39	25.9 +0.4	55.56 +.30	8.5 −0.2
28.7	19.21 .46	60.9 1.6	28.61 .24	24.9 −0.1	19.76 .35	26.6 1.0	55.85 .27	8.6 +0.3
Mar. 10.6	19.63 .38	62.7 2.1	28.84 .21	25.0 +0.3	20.09 .30	27.9 1.5	56.10 .24	9.1 0.8
20.6	19.97 .30	65.0 2.5	29.03 .18	25.5 0.7	20.37 .25	29.7 2.0	56.33 .20	10.1 1.2
30.6	20.23 .21	67.7 2.8	29.19 .14	26.4 1.0	20.59 .19	32.0 2.4	56.51 .16	11.5 1.6
Apr. 9.5	20.40 +.13	70.6 +3.0	29.31 +.10	27.5 +1.3	20.76 +.14	34.5 +2.7	56.65 +.13	13.3 +1.9
19.5	20.48 +.04	73.7 3.1	29.40 .07	28.9 1.5	20.86 .08	37.3 2.8	56.76 .09	15.2 2.1
29.5	20.48 −.05	76.7 3.0	29.45 .04	30.5 1.6	20.91 +.02	40.2 2.9	56.83 .05	17.4 2.2
May 9.5	20.39 .12	79.7 2.9	29.47 +.01	32.1 1.6	20.91 −.03	43.0 2.8	56.86 +.02	19.6 2.2
19.4	20.23 .20	82.6 2.7	29.47 −.02	33.8 1.6	20.85 .08	45.8 2.7	56.86 −.02	21.8 2.2
29.4	20.00 −.26	85.1 +2.4	29.44 −.05	35.4 +1.6	20.75 −.13	48.4 +2.5	56.83 −.05	24.0 +2.1
June 8.4	19.71 .31	87.3 2.0	29.38 .07	36.9 1.4	20.60 .16	50.7 2.1	56.76 .08	26.0 1.9
18.3	19.38 .35	89.1 1.5	29.30 .09	38.2 1.3	20.42 .20	52.7 1.8	56.67 .10	27.7 1.6
28.3	19.00 .39	90.4 1.1	29.20 .11	39.4 1.1	20.20 .23	54.3 1.4	56.56 .13	29.2 1.4
July 8.3	18.60 .41	91.2 +0.5	29.07 .13	40.4 0.8	19.96 .25	55.5 0.9	56.42 .15	30.5 1.1
18.3	18.18 −.43	91.5 0.0	28.94 −.14	41.1 +0.6	19.69 −.27	56.2 +0.5	56.26 −.16	31.3 +0.7
28.2	17.74 .43	91.2 −0.5	28.79 .15	41.5 +0.3	19.41 .28	56.4 0.0	56.09 .17	31.9 +0.4
Aug. 7.2	17.31 .42	90.5 1.0	28.64 .15	41.7 0.0	19.13 .28	56.1 −0.5	55.91 .18	32.1 0.0
17.2	16.89 .41	89.2 1.5	28.48 .15	41.6 −0.3	18.85 .28	55.4 1.0	55.73 .18	31.9 −0.4
27.2	16.50 .38	87.5 2.0	28.33 .14	41.2 0.5	18.57 .27	54.2 1.4	55.55 .17	31.3 0.8
Sept. 6.1	16.14 −.34	85.3 −2.4	28.19 −.13	40.5 −0.8	18.31 −.24	52.5 −1.9	55.38 −.16	30.4 −1.1
16.1	15.82 .29	82.7 2.8	28.07 .11	39.5 1.1	18.09 .21	50.4 2.3	55.23 .14	29.1 1.5
26.1	15.57 .22	79.7 3.1	27.98 .08	38.2 1.4	17.89 .17	47.9 2.7	55.11 .11	27.4 1.8
Oct. 6.0	15.38 .15	76.5 3.4	27.92 −.04	36.6 1.7	17.75 .12	45.1 3.0	55.02 .07	25.4 2.2
16.0	15.27 −.08	72.9 3.6	27.90 .00	34.8 2.0	17.66 −.06	41.9 3.3	54.97 −.03	23.1 2.4
26.0	15.25 +.01	69.2 −3.8	27.92 +.05	32.6 −2.2	17.63 .00	38.5 −3.5	54.97 +.02	20.5 −2.7
Nov. 5.0	15.32 .11	65.4 3.8	28.00 .10	30.3 2.4	17.67 +.07	35.0 3.6	55.02 .08	17.7 2.9
14.9	15.49 .21	61.6 3.7	28.12 .15	27.8 2.5	17.78 .14	31.3 3.6	55.12 .13	14.8 3.0
24.9	15.75 .31	57.9 3.6	28.29 .19	25.1 2.7	17.96 .21	27.7 3.6	55.28 .18	11.7 3.1
Dec. 4.9	16.10 .39	54.4 3.3	28.51 .24	22.4 2.7	18.21 .28	24.1 3.4	55.49 .23	8.6 3.0
14.9	16.54 +.47	51.2 −3.0	28.76 +.27	19.7 −2.7	18.52 +.34	20.8 −3.2	55.74 +.27	5.6 −2.9
24.8	17.04 .53	48.4 2.6	29.05 .30	17.0 2.6	18.88 .38	17.7 2.8	56.03 .31	2.8 2.7
34.8	17.60 +.58	46.1 −2.2	29.36 +.32	14.6 −2.4	19.29 +.42	15.1 −2.4	56.35 +.33	0.2 −2.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	5 Ursæ Minoris.		α² Centauri.		ε Bootis.		α² Libræ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 14 27	° ′ +76 11	h m 14 31	° ′ −60 21	h m 14 39	° ′ +27 33	h m 14 44	° ′ −15 33
	s	″	s	″	s	″	s	″
(Dec. 30.8)	41.82 +.76	58.7 −2.3	52.20 +.53	39.5 +0.1	59.38 +.31	16.5 −2.6	33.54 +.31	52.4 −1.5
Jan. 9.8	42.72 .93	56.6 1.8	52.74 .55	39.6 −0.4	59.70 .32	14.1 2.2	33.86 .32	53.9 1.6
19.8	43.68 .98	55.2 1.1	53.30 .55	40.3 0.9	60.03 .33	12.0 1.8	34.18 .32	55.5 1.6
29.7	44.67 .99	54.4 −0.5	53.85 .54	41.4 1.3	60.36 .33	10.3 1.4	34.31 .32	57.1 1.6
Feb. 8.7	45.66 .97	54.2 +0.2	54.39 .52	43.0 1.7	60.69 .32	9.2 0 9	34.82 .31	58.7 1.5
18.7	46.62 +.92	54.8 +0.9	54.90 +.49	44.8 −2.0	61.00 +.30	8.5 −0.4	35.12 +.29	60.2 −1.4
28.7	47.50 .83	56.0 1.5	55.37 .45	47.0 2.3	61.29 .27	8.3 +0.1	35.40 .27	61.6 1.3
Mar. 10.6	48.28 .72	57.8 2.0	55.79 .40	49.5 2.5	61.55 .24	8.7 0.6	35.65 .24	62.8 1.1
20.6	48.93 .58	60.1 2.5	56.16 .34	52.1 2.7	61.77 .21	9.5 1.0	35.87 .21	63.9 1.0
30.6	49.44 .43	62.8 2.8	56.48 .29	54.8 2.8	61.96 .17	10.7 1.4	36.07 .18	64.8 0.8
Apr. 9.5	49.80 +.28	65.8 +3.1	56.74 +.23	57.6 −2.8	62.12 +.14	12.3 +1.7	36.24 +.15	65.4 −0.6
19.5	50.00 +.12	68.9 3.2	56.94 .17	60.4 2.8	62.24 .10	14.1 1.9	36.37 .12	66.0 0.4
29.5	50.03 −.04	72.1 3.2	57.08 .11	63.1 2.7	62.32 .07	16.1 2.1	36.48 .09	66.3 0.3
May 9.5	49.91 .20	75.3 3.1	57.15 +.05	65.8 2.6	62.37 +.03	18.2 2.1	36.55 .06	66.5 −0.2
19.4	49.64 .34	78.2 2.9	57.17 −.01	68.3 2.4	62.39 .00	20.4 2.1	36.60 .03	66.6 0.0
29.4	49.23 −.46	81.0 +2.5	57.12 −.06	70.6 −2.2	62.37 −.03	22.5 +2.0	36.62 +.01	66.6 +0.1
June 8.4	48.71 .58	83.3 2.1	57.02 .13	72.7 1.9	62.33 .06	24.4 1.9	36.61 −.02	66.5 0.2
18.4	48.08 .67	85.3 1.7	56.86 .18	74.4 1.6	62.25 .09	26.2 1.7	36.58 .05	66.3 0.2
28.3	47.36 .75	86.7 1.2	56.64 .24	75.8 1.2	62.15 .11	27.7 1.4	36.51 .08	66.0 0.3
July 8.3	46.58 .80	87.7 0.7	56.38 .28	76.9 0.8	62.03 .13	29.0 1.1	36.43 .10	65.7 0.4
18.3	45.75 −.83	88.2 +0.2	56.08 −.32	77.5 −0.4	61.88 −.15	30.0 +0.8	36.31 −.12	65.3 +0.4
28.3	44.90 .86	88.1 −0.3	55.74 .34	77.7 0.0	61.72 .17	30.6 0.5	36.18 .14	64.9 0.5
Aug. 7.2	44.04 .85	87.5 0.9	55.39 .36	77.5 +0.5	61.55 .17	30.9 +0.1	36.04 .15	64.4 0.5
17.2	43.19 .83	86.3 1.4	55.03 .36	76.8 0.9	61.37 .18	30.9 −0.2	35.89 .15	63.8 0.6
27.2	42.38 .79	84.7 1.9	54.67 .34	75.7 1.3	61.20 .17	30.5 0.6	35.73 .15	63.3 0.5
Sept. 6.1	41.62 −.72	82.6 −2.3	54.34 −.31	74.2 +1.7	61.03 −.16	29.8 −0.9	35.58 −.14	62.7 +0.5
16.1	40.93 .64	80.1 2.7	54.05 .27	72.4 2.0	60.87 .14	28.6 1.3	35.45 .12	62.2 0.5
26.1	40.34 .54	77.1 3.1	53.81 .21	70.3 2.2	60.74 .11	27.2 1.6	35.34 .10	61.8 0.4
Oct. 6.1	39.85 .42	73.9 3.4	53.63 .14	68.0 2.3	60.64 .08	25.4 1.9	35.26 .06	61.4 0.3
16.0	39.50 .28	70.3 3.6	53.54 −.05	65.6 2.4	60.59 −.04	23.3 2.2	35.22 −.02	61.2 +0.1
26.0	39.29 −.13	66.6 −3.8	53.53 +.04	63.2 +2.4	60.57 +.01	21.0 −2.5	35.23 +.03	61.2 −0.1
Nov. 5.0	39.23 +.03	62.8 3.8	53.61 .13	60.9 2.2	60.61 .05	18.3 2.7	35.28 .06	61.3 0.3
15.0	39.34 .19	58.9 3.8	53.79 .23	58.8 2.0	60.70 .11	15.5 2.9	35.39 .13	61.7 0.5
24.9	39.62 .36	55.1 3.7	54.06 .31	57.0 1.6	60.84 .17	12.6 3.0	35.55 .18	62.4 0.8
Dec. 4.9	40.06 .51	51.5 3.4	54.42 .39	55.5 1.2	61.03 .22	9.6 3.0	35.75 .23	63.3 1.0
14.9	40.65 +.66	48.3 −3.1	54.84 +.45	54.4 +0.8	61.27 +.26	6.7 −2.9	36.00 +.26	64.4 −1.2
24.8	41.38 .79	45.3 2.7	55.33 .50	53.9 +0.3	61.55 .29	3.8 2.7	36.28 .29	65.7 1.4
34.8	42.22 +.89	42.9 −2.1	55.85 +.54	53.8 −0.2	61.86 +.32	1.2 −2.5	36.59 +.32	67.2 −1.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Ursæ Minoris.		β Bootis.		β Libræ.		μ^1 Bootis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 14 50	+74° 36′	h m 14 57	+40° 50′	h m 15 10	− 8° 57′	h m 15 20	+37° 46′
	s	″	s	″	s	″	s	″
(Dec. 30.8)	58.22 +.72	67.5 −2.6	37.59 +.32	21.6 −2.8	51.41 +.28	33.0 −1.6	9.49 +.29	36.4 −2.9
Jan. 9.8	58.98 .80	65.1 2.1	37.92 .35	19.0 2.4	51.71 .30	34.6 1.6	9.80 .32	33.7 2.5
19.8	59.83 .86	63.4 1.5	38.28 .36	16.8 1.9	52.02 .31	36.3 1.6	10.14 .34	31.3 2.1
29.8	60.71 .89	62.2 0.8	38.65 .37	15.1 1.4	52.33 .31	37.8 1.5	10.49 .35	29.4 1.6
Feb. 8.7	61.61 .89	61.8 −0.1	39.02 .36	14.0 0.8	52.64 .30	39.3 1.4	10.84 .35	28.1 1.0
18.7	62.49 +.85	62.0 +0.6	39.38 +.34	13.5 −0.2	52.94 +.29	40.6 −1.2	11.19 +.34	27.3 −0.5
28.7	63.32 .79	62.9 1.2	39.71 .32	13.6 +0.4	53.22 .27	41.6 1.0	11.52 .32	27.2 +0.1
Mar. 10.7	64.07 .70	64.4 1.8	40.02 .29	14.2 0.9	53.48 .25	42.7 0.8	11.83 .29	27.6 0.7
20.6	64.72 .59	66.4 2.3	40.29 .25	15.4 1.4	53.72 .22	43.4 0.6	12.11 .26	28.5 1.2
30.6	65.25 .47	68.9 2.7	40.52 .21	17.1 1.9	53.93 .20	43.9 0.4	12.35 .23	30.0 1.6
Apr. 9.6	65.65 +.33	71.8 +2.9	40.71 +.17	19.1 +2.2	54.12 +.17	44.1 −0.2	12.56 +.19	31.8 +2.0
19.5	65.91 .19	74.8 3.1	40.85 .12	21.5 2.5	54.27 .14	44.2 0.0	12.72 .15	34.0 2.3
29.5	66.03 +.05	78.0 3.2	40.95 .08	24.0 2.6	54.40 .11	44.1 +0.2	12.85 .11	36.4 2.5
May 9.5	66.00 −.09	81.2 3.1	41.01 +.04	26.7 2.7	54.50 .09	43.9 0.3	12.94 .07	39.0 2.6
19.5	65.84 .23	84.3 3.0	41.03 .00	29.4 2.6	54.57 .06	43.5 0.4	12.99 +.03	41.7 2.6
29.4	65.55 −.35	87.2 +2.7	41.01 −.04	32.0 +2.5	54.61 +.03	43.1 +0.4	12.99 −.01	44.3 +2.5
June 8.4	65.14 .46	89.8 2.4	40.94 .08	34.4 2.3	54.62 .00	42.6 0.5	12.96 .05	46.7 2.4
18.4	64.63 .55	92.0 2.0	40.85 .11	36.5 2.0	54.61 −.03	42.1 0.5	12.89 .09	49.0 2.2
28.4	64.04 .63	93.8 1.5	40.72 .14	38.4 1.7	54.56 .06	41.6 0.5	12.79 .12	51.0 1.9
July 8.3	63.37 .70	95.1 1.0	40.56 .17	40.0 1.4	54.49 .09	41.1 0.5	12.65 .15	52.7 1.5
18.3	62.64 −.74	95.9 +0.5	40.37 −.19	41.1 +1.0	54.39 −.11	40.6 +0.5	12.49 −.18	54.1 +1.2
28.3	61.88 .77	96.2 0.0	40.17 .21	41.9 0.5	54.27 .13	40.1 0.5	12.30 .20	55.1 0.8
Aug. 7.2	61.09 .78	95.9 −0.5	39.95 .22	42.2 +0.1	54.13 .14	39.6 0.5	12.09 .21	55.6 +0.4
17.2	60.31 .78	95.1 1.0	39.72 .23	42.1 −0.3	53.98 .15	39.1 0.4	11.87 .22	55.8 −0.1
27.2	59.54 .75	93.8 1.5	39.49 .23	41.5 0.8	53.82 .16	38.7 0.4	11.65 .22	55.5 0.5
Sept. 6.2	58.81 −.70	92.0 −2.0	39.27 −.22	40.5 −1.2	53.67 −.15	38.4 +0.3	11.42 −.22	54.8 −0.9
16.1	58.13 .64	89.8 2.5	39.06 .19	39.1 1.6	53.52 .14	38.2 0.2	11.21 .20	53.7 1.3
26.1	57.53 .56	87.1 2.9	38.88 .16	37.3 2.0	53.40 .11	38.0 +0.1	11.02 .18	52.1 1.7
Oct. 6.1	57.02 .45	84.1 3.2	38.73 .13	35.1 2.4	53.30 .08	38.0 −0.1	10.86 .14	50.2 2.1
16.1	56.62 .34	80.7 3.5	38.62 .08	32.5 2.7	53.23 −.04	38.2 0.2	10.73 .10	47.9 2.4
26.0	56.34 −.20	77.1 −3.7	38.57 −.03	29.6 −3.0	53.21 .00	38.5 −0.4	10.66 −.05	45.3 −2.8
Nov. 5.0	56.21 −.06	73.4 3.8	38.57 +.03	26.5 3.2	53.24 +.05	39.0 0.6	10.63 .00	42.4 3.0
15.0	56.22 +.09	69.5 3.8	38.63 .09	23.2 3.4	53.32 .10	39.8 0.9	10.66 +.06	39.2 3.2
25.0	56.39 .24	65.7 3.8	38.75 .15	19.8 3.4	53.44 .15	40.8 1.1	10.76 .12	35.9 3.3
Dec. 4.9	56.71 .39	62.0 3.6	38.93 .21	16.4 3.4	53.62 .20	42.0 1.3	10.90 .18	32.6 3.3
14.9	57.17 +.53	58.5 −3.3	39.16 +.26	13.0 −3.3	53.84 +.24	43.3 −1.4	11.11 +.23	29.2 −3.3
24.9	57.77 .65	55.4 2.9	39.44 .30	9.9 3 0	54.09 .27	44.8 1.6	11.36 .27	26.1 3.1
34.8	58.48 +.76	52.7 −2.4	39.76 +.34	7.0 −2.7	54.38 +.29	46.4 −1.6	11.65 +.31	23.1 −2.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ^2 Ursæ Minoris.		α Coronæ Borealis.		α Serpentis.		ε Serpentis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 15 20	° ′ +72 14	h m 15 29	° ′ +27 5	h m 15 38	° ′ + 6 46	h m 15 45	° ′ + 4 49
	s	″	s	″	s	″	s	″
(Dec. 30.9)	50.75 +.57	15.7 −2.9	50.32 +.27	56.2 −2.7	38.01 +.26	70.8 −2.1	6.84 +.25	23.8 −2.1
Jan. 9.8	51.36 .66	13.0 2.4	50.61 .30	53.5 2.5	38.28 .28	68.7 2.0	7.11 .28	21.7 2.0
19.8	52.06 .73	10.9 1.9	50.92 .32	51.2 2.1	38.57 .30	66.8 1.9	7.39 .29	19.8 1.8
29.8	52.82 .77	9.3 1.2	51.24 .32	49.3 1.7	38.87 .30	65.0 1.6	7.69 .30	18.1 1.6
Feb. 8.8	53.60 .78	8.4 −0.6	51.56 .32	47.8 1.2	39.18 .30	63.5 1.3	8.00 .30	16.6 1.3
18.7	54.38 +.77	8.2 +0.1	51.88 +.31	46.8 −0.7	39.47 +.29	62.3 −1.0	8.29 +.29	15.4 −1.0
28.7	55.13 .73	8.6 0.8	52.19 .30	46.4 −0.2	39.76 .28	61.5 0.7	8.58 .28	14.5 0.7
Mar. 10.7	55.84 .67	9.7 1.4	52.47 .27	46.4 +0.3	40.03 .26	61.0 −0.3	8.85 .26	14.0 −0.3
20.6	56.47 .59	11.4 2.0	52.73 .25	47.0 0.8	40.28 .24	60.9 +0.1	9.11 .24	13.9 0.0
30.6	57.01 .49	13.6 2.4	52.97 .22	48.0 1.2	40.51 .21	61.2 0.4	9.34 .22	14.0 +0.3
Apr. 9.6	57.44 +.38	16.3 +2.8	53.17 +.19	49.4 +1.6	40.71 +.19	61.7 +0.7	9.54 +.19	14.5 +0.6
19.6	57.76 .26	19.2 3.0	53.34 .15	51.2 1.9	40.88 .16	62.5 0.9	9.72 .17	15.2 0.8
29.5	57.96 .14	22.4 3.2	53.47 .12	53.2 2.1	41.03 .13	63.6 1.1	9.87 .14	16.1 1.0
May 9.5	58.04 +.02	25.6 3.2	53.57 .08	55.3 2.2	41.14 .10	64.7 1.2	10.00 .11	17.2 1.2
19.5	58.00 −.10	28.8 3.1	53.64 .05	57.6 2.3	41.23 .07	66.0 1.3	10.09 .08	18.4 1.2
29.4	57.83 −.21	31.8 +3.0	53.67 +.01	59.9 +2.2	41.29 +.04	67.4 +1.3	10.16 +.05	19.7 +1.3
June 8.4	57.56 .32	34.7 2.7	53.67 −.02	62.0 2.1	41.32 +.01	68.7 1.3	10.20 +.02	21.0 1.2
18.4	57.20 .41	37.2 2.3	53.64 .05	64.1 1.9	41.31 −.02	70.0 1.3	10.20 −.01	22.2 1.2
28.4	56.74 .50	39.3 1.9	53.57 .08	65.9 1.7	41.28 .05	71.2 1.2	10.17 .04	23.3 1.1
July 8.3	56.20 .57	41.1 1.5	53.47 .11	67.5 1.5	41.22 .08	72.4 1.0	10.11 .07	24.4 1.0
18.3	55.61 −.62	42.3 +1.0	53.34 −.14	68.9 +1.2	41.13 −.10	73.3 +0.9	10.02 −.10	25.4 +0.8
28.3	54.96 .66	43.0 +0.5	53.19 .16	69.9 0.9	41.01 .13	74.1 0.7	9.91 .12	26.1 0.7
Aug. 7.3	54.29 .69	43.3 0.0	53.02 .18	70.6 0.5	40.87 .15	74.8 0.5	9.78 .14	26.8 0.6
17.2	53.59 .70	42.9 −0.6	52.83 .19	70.9 +0.1	40.72 .16	75.2 0.3	9.62 .16	27.2 0.4
27.2	52.89 .69	42.1 1.1	52.64 .19	70.9 −0.2	40.55 .17	75.5 +0.1	9.46 .17	27.5 +0.2
Sept. 6.2	52.21 −.66	40.8 −1.6	52.45 −.19	70.5 −0.6	40.39 −.16	75.5 −0.1	9.29 −.16	27.6 0.0
16.1	51.57 .62	38.9 2.1	52.26 .18	69.7 0.9	40.23 .15	75.3 0.3	9.13 .15	27.5 −0.2
26.1	50.98 .56	36.6 2.5	52.09 .16	68.6 1.3	40.08 .14	74.9 0.5	8.98 .14	27.1 0.4
Oct. 6.1	50.46 .46	33.9 2.9	51.95 .13	67.0 1.7	39.95 .11	74.2 0.8	8.86 .11	26.6 0.7
16.1	50.03 .38	30.8 3.2	51.84 .09	65.2 2.0	39.86 .07	73.3 1.0	8.76 .08	25.8 0.9
26.0	49.70 −.27	27.5 −3.5	51.77 −.04	63.0 −2.3	39.81 −.03	72.2 −1.3	8.70 −.04	24.8 −1.1
Nov. 5.0	49.49 .15	23.8 3.7	51.75 +.01	60.6 2.6	39.80 +.02	70.8 1.5	8.69 +.01	23.5 1.4
15.0	49.41 −.01	20.1 3.8	51.79 .06	57.9 2.8	39.84 .07	69.2 1.7	8.72 .06	22.0 1.6
25.0	49.46 +.12	16.2 3.8	51.87 .11	55.0 2.9	39.93 .11	67.3 1.9	8.81 .11	20.3 1.8
Dec. 4.9	49.65 .26	12.4 3.7	52.01 .16	52.1 3.0	40.07 .16	65.3 2.1	8.94 .16	18.4 1.9
14.9	49.98 +.39	8.8 −3.5	52.20 +.21	49.0 −3.0	40.26 +.20	63.2 −2.2	9.12 +.20	16.4 −2.0
24.9	50.43 .51	5.4 3.2	52.44 .25	46.1 2.9	40.48 .24	61.0 2.2	9.34 .24	14.3 2.1
34.8	50.99 +.61	2.4 −2.8	52.71 +.29	43.3 −2.7	40.74 +.27	58.9 −2.1	9.60 +.27	12.2 −2.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Ursæ Minoris.		ε Coronæ Borealis.		δ Scorpii.		β¹ Scorpii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	15 47	+78 8	15 52	+27 12	15 53	−22 17	15 58	−19 29
	s	″	s	″	s	″	s	″
(Dec.30.9)	62.50 +.69	35.9 −3.1	50.69 +.26	32.1 −2.8	34.43 +.28	34.4 −0.9	47.37 +.27	21.4 −0.9
Jan. 9.9	63.27 .84	33.0 2.7	50.96 .29	29.4 2.5	34.75 .30	35.2 1.0	47.66 .29	22.4 1.0
19.8	64.18 .96	30.6 2.1	51.25 .30	27.0 2.3	35.06 .32	36.2 1.1	47.96 .31	23.5 1.1
29.8	65.20 1.06	28.8 1.5	51.56 .32	24.9 1.8	35.38 .33	37.3 1.2	48.28 .32	24.6 1.2
Feb. 8.8	66.30 1.11	27.6 0.9	51.88 .32	23.3 1.4	35.71 .33	38.5 1.2	48.60 .32	25.8 1.2
18.8	67.42 1.11	27.1 −0.2	52.20 +.32	22.2 −0.9	36.04 +.32	39.6 −1.1	48.92 +.31	26.9 −1.1
28.7	68.53 1.09	27.3 +0.5	52.51 .31	21.6 −0.4	36.35 .31	40.7 1.1	49.23 .30	27.9 1.0
Mar. 10.7	69.59 1.02	28.1 1.1	52.81 .29	21.5 +0.2	36.65 .29	41.7 1.0	49.52 .29	28.9 0.9
20.7	70.57 .92	29.6 1.8	53.08 .26	22.0 0.7	36.93 .27	42.6 0.9	49.80 .27	29.7 0.8
30.6	71.43 .79	31.6 2.2	53.33 .23	22.9 1.2	37.19 .25	43.4 0.8	50.06 .25	30.4 0.6
Apr. 9.6	72.15 +.63	34.0 +2.6	53.55 +.20	24.3 +1.6	37.42 +.22	44.2 −0.7	50.29 +.22	30.9 −0.5
19.6	72.70 .46	36.8 3.0	53.74 .17	26.0 1.9	37.63 .19	44.8 0.6	50.50 .20	31.4 0.4
29.6	73.08 .29	39.9 3.2	53.90 .14	28.0 2.1	37.81 .17	45.4 0.5	50.69 .17	31.8 0.3
May 9.5	73.27 +.10	43.1 3.2	54.02 .11	30.2 2.3	37.97 .14	45.7 0.4	50.84 .14	32.0 0.2
19.5	73.28 −.07	46.3 3.2	54.11 .08	32.5 2.3	38.09 .11	46.1 0.4	50.97 .11	32.2 −0.1
29.5	73.13 −.26	49.4 +3.1	54.17 +.04	34.8 +2.3	38.18 +.08	46.4 −0.3	51.06 +.08	32.3 0.0
June 8.5	72.77 .43	52.4 2.9	54.19 .00	37.1 2.2	38.24 +.04	46.6 0.2	51.12 .04	32.3 0.0
18.4	72.27 .57	55.1 2.6	54.17 −.04	39.3 2.1	38.26 .00	46.8 −0.1	51.15 +.01	32.3 0.0
28.4	71.62 .72	57.5 2.2	54.12 .07	41.3 1.9	38.24 −.04	46.9 0.0	51.14 −.02	32.3 0.0
July 8.4	70.84 .85	59.5 1.7	54.03 .10	43.0 1.6	38.19 .07	46.9 0.0	51.10 .06	32.2 0.0
18.3	69.93 −.93	61.0 +1.2	53.92 −.13	44.5 +1.4	38.11 −.10	46.9 0.0	51.02 −.10	32.1 +0.1
28.3	68.95 1.01	62.0 0.7	53.77 .16	45.7 1.1	38.00 .13	46.8 +0.1	50.91 .13	31.9 0.1
Aug. 7.3	67.91 1.06	62.5 +0.2	53.60 .18	46.6 0.7	37.86 .15	46.6 0.2	50.77 .15	31.7 0.2
17.3	66.83 1.10	62.5 −0.2	53.42 .19	47.1 +0.3	37.70 .16	46.3 0.3	50.62 .16	31.4 0.3
27.2	65.72 1.10	62.0 0.7	53.22 .20	47.2 0.0	37.53 .17	45.9 0.4	50.45 .17	31.1 0.3
Sept. 6.2	64.64 1.07	61.0 −1.2	53.01 −.21	47.0 −0.4	37.35 −.18	45.6 +0.5	50.27 −.17	30.8 +0.4
16.2	63.58 1.02	59.5 1.7	52.82 .19	46.4 0.8	37.17 .17	45.1 0.5	50.10 .16	30.4 0.4
26.2	62.60 .94	57.5 2.2	52.64 .17	45.4 1.2	37.01 .15	44.6 0.5	49.94 .14	30.0 0.4
Oct. 6.1	61.70 .84	55.0 2.6	52.47 .15	44.0 1.6	36.88 .12	44.1 0.4	49.80 .12	29.6 0.4
16.1	60.91 .72	52.2 3.0	52.34 .11	42.3 1.9	36.77 .09	43.7 0.4	49.70 .09	29.3 0.3
26.1	60.27 −.56	49.0 −3.3	52.25 −.06	40.3 −2.2	36.71 −.04	43.3 +0.3	49.63 −.05	29.0 +0.2
Nov. 5.0	59.79 .39	45.6 3.6	52.21 −.02	37.9 2.5	36.70 +.02	43.0 +0.2	49.60 .00	28.9 +0.1
15.0	59.49 −.20	41.9 3.7	52.21 +.03	35.3 2.7	36.74 .07	42.8 −0.1	49.64 +.06	28.9 −0.1
25.0	59.38 +.01	38.2 3.8	52.27 .09	32.5 2.9	36.83 .12	42.9 0.2	49.73 .11	29.1 0.3
Dec. 5.0	59.51 .21	34.4 3.8	52.39 .14	29.5 3.0	36.98 .17	43.1 0.3	49.86 .16	29.5 0.5
14.9	59.80 +.40	30.7 −3.6	52.55 +.18	26.5 −3.0	37.18 +.22	43.6 −0.5	50.05 +.21	30.1 −0.6
24.9	60.31 .59	27.2 3.3	52.76 .23	23.5 2.9	37.42 .26	44.2 0.7	50.28 .25	30.8 0.8
34.9	60.97 +.74	24.1 −3.1	53.01 +.27	20.7 −2.7	37.69 +.29	45.0 −0.9	50.55 +.28	31.8 −1.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombridge 2320.		δ Ophiuchi.		τ Herculis.		α Scorpii. (*Antares.*)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 16 5	° ′ +68 6	h m 16 8	° ′ − 3 23	h m 16 16	° ′ +46 34	h m 16 22	° ′ −26 10
	s	″	s	″	s	″	s	″
(Dec. 30.9)	56.97 +.39	35.0 −3.3	21.07 +.25	51.7 −1.7	16.88 +.25	66.1 −3.3	23.77 +.26	28.0 −0.4
Jan. 9.9	57.41 .48	31.9 2.9	21.33 .27	53.4 1.7	17.16 .30	63.0 3.0	24.05 .29	28.5 0.6
19.8	57.92 .55	29.2 2.4	21.61 .29	55.0 1.6	17.48 .34	60.1 2.5	24.35 .31	29.2 0.7
29.8	58.51 .60	27.1 1.9	21.91 .30	56.5 1.5	17.83 .37	57.9 2.0	24.67 .33	29.8 0.8
Feb. 8.8	59.13 .63	25.5 1.3	22.21 .30	57.9 1.3	18.21 .38	56.1 1.5	25.01 .33	30.8 0.9
18.8	59.77 +.64	24.6 −0.6	22.51 +.30	59.0 −1.0	18.59 +.38	54.9 −0.9	25.34 +.33	31.7 −0.9
28.7	60.41 .63	24.4 +0.2	22.80 .28	60.0 0.8	18.97 .37	54.3 −0.3	25.67 .32	32.5 0.9
Mar. 10.7	61.03 .60	24.9 0.9	23.08 .27	60.6 0.5	19.93 .35	54.4 +0.4	25.99 .31	33.4 0.8
20.7	61.61 .55	26.1 1.5	23.34 .26	61.0 −0.3	19.68 .33	55.1 1.0	26.29 .29	34.2 0.8
30.6	62.14 .49	27.8 2.1	23.59 .24	61.1 0.0	20.00 .31	56.4 1.5	26.57 .27	35.0 0.7
Apr. 9.6	62.59 +.41	30.3 +2.5	23.81 +.21	61.0 +0.3	20.29 +.27	58.2 +2.0	26.84 +.25	35.7 −0.7
19.6	62.96 .33	32.7 2.7	24.01 .19	60.6 0.5	20.53 .22	60.5 2.4	27.08 .23	36.3 0.6
29.6	63.24 .24	35.7 3.0	24.19 .17	60.1 0.6	20.74 .18	63.0 2.7	27.29 .20	36.9 0.5
May 9.5	63.43 .14	38.8 3.2	24.34 .14	59.4 0 7	20.89 .13	65.9 2.9	27.48 .17	37.4 0.5
19.5	63.53 +.05	42.1 3.2	24.46 .11	58.6 0.8	21.00 .08	68.8 3.0	27.64 .14	37.9 0.5
29.5	63.53 −.06	45.3 +3.2	24.56 +.08	57.8 +0.9	21.06 +.04	71.8 +3.0	27.76 +.11	38.3 −0.4
June 8.5	63.40 .16	48.4 3.0	24.62 .04	56.9 0.9	21.08 −.01	74.8 2.9	27.85 .07	38.7 0.4
18.4	63.21 .24	51.3 2.7	24.64 +.01	56.0 0.8	21.04 .06	77.6 2.7	27.90 +.03	39.1 0.3
28.4	62.93 .32	53.9 2.5	24.64 −.02	55.2 0.8	20.95 .11	80.2 2.5	27.91 −.01	39.4 0.3
July 8.4	62.57 .39	56.2 2.1	24.59 .03	54.4 0.8	20.82 .15	82.6 2.1	27.88 .05	39.7 0.2
18.3	62.16 −.45	58.1 +1.6	24.52 −.06	53.7 +0.7	20.65 −.19	84.4 +1.7	27.82 −.08	39.9 −0.2
28.3	61.67 .50	59.5 1.2	24.42 .08	53.0 0.6	20.44 .23	86.0 1.4	27.72 .12	40.0 −0.1
Aug. 7.3	61.15 .54	60.4 0.6	24.30 .11	52.5 0.5	20.20 .26	87.1 0.9	27.58 .15	40.0 0.0
17.3	60.59 .57	60.8 +0.2	24.15 .13	52.1 0.4	19.93 .27	87.8 +0.5	27.42 .17	40.0 +0.1
27.2	60.01 .60	60.7 −0.4	23.99 .16	51.7 0.3	19.65 .29	88.1 0.0	27.24 .18	39.8 0.2
Sept. 6.2	59.40 −.60	60.0 −0.9	23.83 −.17	51.5 +0.1	19.35 −.29	87.8 −0.5	27.06 −.19	39.5 +0.3
16.2	58.82 .56	58.9 1.4	23.66 .17	51.5 0.0	19.07 .28	87.1 1.0	26.86 .19	39.1 0.4
26.2	58.28 .52	57.2 1.9	23.50 .15	51.5 −0.1	18.79 .27	85.8 1.5	26.68 .17	38.6 0.5
Oct. 6.1	57.78 .47	55.1 2.4	23.36 .13	51.7 0.3	18.53 .24	84.2 1.9	26.52 .15	38.1 0.5
16.1	57.34 .40	52.5 2.8	23.25 .09	52.1 0.5	18.32 .20	82.1 2.4	26.40 .11	37.6 0.5
26.1	56.98 −.32	49.5 −3.2	23.18 −.07	52.7 −0.7	18.14 −.15	79.5 −2.7	26.31 −.07	37.1 +0.5
Nov. 5.0	56.70 .23	46.2 3.4	23.15 −.03	53.5 0.9	18.02 .09	76.7 3.0	26.26 −.02	36.6 0.4
15.0	56.52 .12	42.6 3.6	23.16 +.04	54.5 1.1	17.96 −.03	73.5 3.3	26.28 +.04	36.2 0.3
25.0	56.46 −.01	38.9 3.7	23.23 .10	55.7 1.3	17.96 +.03	70.1 3.5	26.34 .09	35.9 +0.2
Dec. 5.0	56.50 +.10	35.1 3.8	23.35 .14	57.0 1.4	18.03 .10	66.5 3.6	26.46 .15	35.8 0.0
14.9	56.67 +.22	31.3 −3.7	23.51 +.18	58.5 −1.5	18.16 +.15	63.0 −3.6	26.64 +.20	35.9 −0.2
24.9	56.94 .33	27.7 3.4	23.72 .22	60.1 1.6	18.36 .23	59.4 3.5	26.86 .24	36.1 0.3
34.9	57.32 +.43	24.5 −3.1	23.96 +.25	61.8 −1.7	18.61 +.28	56.1 −3.1	27.12 +.28	36.6 −0.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Draconis.		β Herculis.		A Draconis.		ζ Ophiuchi.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 16 22	° ′ +61 46	h m 16 25	° ′ +21 44	h m 16 28	° ′ +69 0	h m 16 30	° ′ −10 19
	s	″	s	″	s	″	s	″
(Dec.30.9)	24.10 +.30	19.2 −3.4	17.70 +.23	23.1 −2.7	8.86 +.34	51.2 −3.4	51.60 +.23	57.4 −1.2
Jan. 9.9	24.44 .37	15.9 3.1	17.94 .25	20.4 2.5	9.26 .45	47.9 3.1	51.85 .26	58.6 1.3
19.8	24.85 .43	13.1 2.6	18.21 .28	18.1 2.2	9.75 .53	45.0 2.6	52.12 .28	59.9 1.3
29.8	25.31 .48	10.7 2.1	18.50 .29	16.0 1.9	10.31 .59	42.7 2.1	52.41 .30	61.1 1.2
Feb. 8.8	25.80 .51	8.9 1.5	18.80 .30	14.2 1.5	10.93 .64	40.9 1.5	52.71 .30	62.3 1.1
18.8	26.32 +.52	7.8 −0.8	19.10 +.30	13.0 −1.0	11.59 +.66	39.7 −0.8	53.02 +.30	63.3 −1.0
28.7	26.84 .51	7.3 −0.1	19.41 .30	12.2 0.6	12.25 .66	39.2 −0.1	53.32 .30	64.2 0.8
Mar. 10.7	27.35 .49	7.5 +0.5	19.70 .29	11.9 −0.1	12.91 .64	39.4 +0.6	53.61 .29	64.9 0.6
20.7	27.83 .46	8.4 1.2	19.98 .27	12.0 +0.4	13.53 .60	40.3 1.2	53.89 .27	65.3 0.4
30.7	28.27 .42	9.8 1.7	20.24 .25	12.7 0.9	14.10 .54	41.8 1.8	54.15 .25	65.6 −0.2
Apr. 9.6	28.66 +.36	11.9 +2.2	20.48 +.23	13.7 +1.2	14.61 +.47	43.8 +2.3	54.40 +.23	65.6 0.0
19.6	29.00 .30	14.3 2.6	20.70 .20	15.2 1.6	15.04 .39	46.3 2.7	54.62 .21	65.5 +0.2
29.6	29.26 .23	17.2 2.9	20.88 .17	16.9 1.9	15.38 .29	49.2 3.0	54.82 .19	65.3 0.3
May 9.5	29.46 .16	20.2 3.1	21.04 .14	18.9 2.0	15.63 .19	52.3 3.2	55.00 .16	64.9 0.4
19.5	29.58 .08	23.5 3.2	21.16 .11	21.0 2.1	15.77 +.09	55.5 3.3	55.14 .13	64.4 0.5
29.5	29.63 +.01	26.7 +3.2	21.25 +.07	23.2 +2.2	15.81 −.01	58.8 +3.2	55.26 +.10	63.9 +0.5
June 8.5	29.60 −.06	29.9 3.1	21.31 +.04	25.3 2.1	15.75 .11	62.0 3.1	55.35 .07	63.4 0.6
18.4	29.50 .14	32.9 2.9	21.33 .00	27.5 2.1	15.59 .21	65.1 2.9	55.40 +.03	62.8 0.5
28.4	29.33 .20	35.7 2.6	21.31 −.03	29.4 1.9	15.34 .30	67.9 2.7	55.42 .00	62.3 0.5
July 8.4	29.09 .27	38.1 2.3	21.26 .07	31.2 1.7	15.00 .38	70.4 2.3	55.40 −.04	61.8 0.5
18.4	28.79 −.32	40.2 +1.9	21.17 −.10	32.8 +1.5	14.58 −.45	72.5 +1.9	55.34 −.07	61.3 +0.4
28.3	28.45 .37	41.8 1.4	21.05 .13	34.1 1.2	14.10 .51	74.2 1.5	55.25 .10	60.9 0.4
Aug. 7.3	28.05 .41	43.0 0.9	20.91 .16	35.2 0.9	13.56 .56	75.4 1.0	55.14 .13	60.5 0.4
17.3	27.63 .44	43.7 +0.4	20.73 .18	35.9 0.6	12.97 .60	76.1 +0.5	55.00 .15	60.1 0.3
27.2	27.18 .45	43.9 −0.1	20.55 .19	36.3 +0.2	12.36 .62	76.3 −0.1	54.83 .17	59.9 0.3
Sept. 6.2	26.73 −.45	43.6 −0.6	20.35 −.20	36.4 −0.1	11.74 −.62	76.0 −0.6	54.66 −.17	59.6 +0.2
16.2	26.28 .44	42.7 1.1	20.15 .19	36.1 0.5	11.12 .61	75.1 1.1	54.48 .16	59.5 +0.1
26.2	25.84 .42	41.3 1.6	19.96 .18	35.4 0.8	10.52 .58	73.8 1.6	54.32 .16	59.4 0.0
Oct. 6.1	25.43 .38	39.5 2.1	19.79 .16	34.5 1.2	9.95 .53	71.9 2.1	54.16 .14	59.4 −0.1
16.1	25.08 .33	37.2 2.5	19.65 .13	33.1 1.5	9.45 .47	69.6 2.5	54.04 .11	59.4 0.2
26.1	24.77 −.26	34.4 −2.9	19.54 −.09	31.5 −1.8	9.02 −.39	66.8 −2.9	53.95 −.07	59.7 −0.3
Nov. 5.1	24.55 .19	31.3 3.3	19.47 −.04	29.5 2.1	8.67 .30	63.7 3.3	53.90 −.02	60.0 0.5
15.0	24.40 .10	27.9 3.5	19.45 .00	27.2 2.4	8.43 .19	60.3 3.5	53.90 +.02	60.6 0.6
25.0	24.34 −.02	24.3 3.7	19.48 +.05	24.8 2.6	8.30 −.07	56.7 3.7	53.95 .07	61.3 0.8
Dec. 5.0	24.36 +.07	20.5 3.8	19.56 .11	22.1 2.7	8.28 +.05	52.9 3.8	54.05 .12	62.2 0.9
15.0	24.48 +.17	16.8 −3.7	19.69 +.16	19.4 −2.8	8.39 +.16	49.1 −3.7	54.20 +.17	63.2 −1.1
24.9	24.70 .25	13.1 3.6	19.87 .20	16.6 2.8	8.61 .26	45.4 3.6	54.39 .21	64.3 1.2
34.9	24.99 +.33	9.6 −3.3	20.09 +.24	13.9 −2.7	8.95 +.39	41.9 −3.3	54.62 +.24	65.6 −1.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Trianguli Australis.		*η* Herculis.		*κ* Ophiuchi.		*d* Herculis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$16^{h}\ 36^{m}$	$-68^{\circ}\ 48'$	$16^{h}\ 38^{m}$	$+39^{\circ}\ 8'$	$16^{h}\ 52^{m}$	$+\ 9^{\circ}\ 33'$	$16^{h}\ 57^{m}$	$+33^{\circ}\ 43'$
	s	″	s	″	s	″	s	″
(Dec.30.9)	33.18 +.53	40.5 +1.7	57.44 +.21	24.4 −3.3	14.94 +.20	17.6 −2.1	22.12 +.19	65.7 −3.2
Jan. 9.9	33.76 .61	38.9 1.5	57.67 .26	21.2 3.0	15.15 .23	15.4 2.0	22.34 .24	62.7 2.9
19.9	34.40 .67	37.6 1.1	57.95 .29	18.4 2.6	15.40 .26	13.4 1.9	22.60 .28	59.9 2.6
29.8	35.10 .72	36.8 0.6	58.26 .32	16.0 2.2	15.67 .27	11.6 1.7	22.88 .29	57.5 2.2
Feb. 8.8	35.83 .75	36.4 +0.2	58.60 .34	14.1 1.7	15.95 .29	10.0 1.4	23.18 .31	55.4 1.8
18.8	36.59 +.76	36.4 −0.2	58.94 +.34	12.6 −1.1	16.24 +.29	8.8 −1.1	23.50 +.32	53.9 −1.3
28.8	37.35 .75	36.8 0.6	59.28 .34	11.8 −0.5	16.53 .29	7.8 0.7	23.83 .32	53.0 0.7
Mar.10.7	38.09 .73	37.6 1.0	59.62 .33	11.6 +0.1	16.82 .28	7.3 −0.3	24.15 .32	52.5 −0.1
20.7	38.81 .70	38.7 1.3	59.94 .32	12.0 0.7	17.09 .27	7.2 +0.1	24.46 .31	52.7 +0.5
30.7	39.49 .66	40.2 1.6	60.25 .29	13.0 1.2	17.36 .26	7.5 0.5	24.76 .29	53.5 1.0
Apr. 9.6	40.13 +.60	42.0 −1.9	60.53 +.26	14.4 +1.7	17.61 +.24	8.1 +0.8	25.04 +.27	54.7 +1.5
19.6	40.71 .54	44.1 2.1	60.78 .23	16.4 2.1	17.83 .22	9.1 1.1	25.29 .24	56.4 1.9
29.6	41.22 .47	46.3 2.3	60.99 .20	18.7 2.4	18.04 .19	10.3 1.3	25.51 .21	58.5 2.2
May 9.6	41.65 .39	48.7 2.5	61.17 .16	21.2 2.7	18.22 .17	11.7 1.5	25.70 .18	60.9 2.5
19.5	42.01 .31	51.3 2.6	61.31 .12	24.0 2.8	18.37 .14	13.3 1.6	25.86 .14	63.5 2.6
29.5	42.27 +.22	53.9 −2.6	61.40 +.07	26.8 +2.8	18.50 +.11	15.0 +1.7	25.98 +.10	66.2 +2.7
June 8.5	42.44 .12	56.5 2.6	61.45 +.03	29.7 2.8	18.59 .07	16.7 1.7	26.05 .06	68.9 2.7
18.5	42.51 +.02	59.1 2.5	61.46 −.02	32.4 2.7	18.65 +.04	18.4 1.6	26.09 +.0.	71.6 2.6
28.4	42.48 −.08	61.5 2.4	61.42 .06	35.0 2.5	18.67 .00	19.9 1.5	26.08 −.03	74 1 2.4
July 8.4	42.35 .18	63.8 2.1	61.34 .10	37.4 2.2	18.65 −.03	21.4 1.4	26.03 .07	76.5 2.2
18.4	42.12 −.27	65.8 −1.8	61.22 −.14	39.5 +1.9	18.60 −.07	22.7 +1.2	25.94 −.11	78.6 +1.9
28.3	41.81 .35	67.5 1.5	61.06 .18	41.2 1.5	18.51 .10	23.9 1.0	25.81 .15	80.4 1.6
Aug. 7.3	41.42 .42	68.8 1.1	60.86 .21	42.5 1.1	18.39 .13	24.8 0.8	25.65 .18	81.8 1.3
17.3	40.96 .47	69.7 0.7	60.64 .23	43.4 0.7	18.25 .16	25.5 0.6	25.45 .20	82.9 0.9
27.3	40.46 .51	70.2 −0.2	60.40 .25	44.0 +0.3	18.08 .17	26.0 0.4	25.24 .22	83.6 +0.5
Sept. 6.2	39.93 −.53	70.2 +0.2	60.15 −.26	44.0 −0.2	17.90 −.18	26.2 +0.1	25.01 −.23	63.4 0.0
16.2	39.41 .52	69.7 0.7	59.89 .25	43.6 0.6	17.72 .18	26.2 −0.1	24.77 .24	83.7 −0.4
26.2	38.90 .49	68.8 1.2	59.64 .25	42.8 1.1	17.54 .17	26.0 0.4	24.53 .23	83.1 0.8
Oct. 6.2	38.44 .43	67.4 1.6	59.41 .22	41.5 1.5	17.37 .16	25.4 0.7	24.31 .21	82.1 1.2
16.1	38.04 .35	65.6 1.9	59.21 .19	39.7 1.9	17.22 .13	24.6 0.9	24.11 .18	80.6 1.6
26.1	37.74 −.25	63.5 +2.2	59.04 −.15	37.6 −2.3	17.11 −.10	23.6 −1.2	23.95 −.14	78.8 −2.0
Nov. 5.1	37.54 .14	61.6 2.4	58.92 .10	35.1 2.7	17.03 .06	22.3 1.4	23.83 .10	76.6 2.4
15.0	37.47 −.01	58.6 2.5	58.85 −.04	32.3 3.0	17.00 −.01	20.7 1.7	23.75 −.05	74.0 2.7
25.0	37.51 +.11	56.1 2.5	58.84 +.02	29.1 3.2	17.01 +.04	18.9 1.9	23.73 .00	71.2 2.9
Dec. 5.0	37.69 .24	53.6 2.4	58.89 .08	25.9 3.3	17.08 .09	17.0 2.0	23.76 +.06	68.2 3.1
15.0	37.99 +.36	51.3 +2.2	58.99 +.13	22.5 −3.4	17.19 +.13	14.9 −2.1	23.85 +.11	65.0 −3.2
24.9	38.41 .47	49.1 2.0	59.16 .19	19.1 3.3	17.34 .18	12.7 2.2	23.99 .17	61.8 3.2
34.9	38.93 +.56	47.3 +1.7	59.37 +.24	15.9 −3.1	17.54 +.22	10.5 −2.2	24.18 +.22	58.7 −3.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*ε* Ursæ Minoris.		*α*¹ Herculis.		*b* Ophiuchi.		*β* Draconis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 16 57	° ′ +82 13	h m 17 9	° ′ +14 31	h m 17 19	° ′ −24 3	h m 17 27	° ′ +52 22
	s	″	s	″	s	″	s	″
(Dec.30.9)	30.90 +.55	24.7 −3.4	25.49 +.18	21.9 −2.3	22.96 +.21	58.5 −0.2	49.14 +.16	73.6 −3.5
Jan. 9.9	31.59 .82	21.4 3.1	25.69 .22	19.6 2.3	23.19 .24	58.8 0.3	49.34 .23	70.2 3.3
19.9	32.55 1.11	18.4 2.7	25.92 .25	17.4 2.1	23.45 .27	59.1 0.4	49.60 .28	66.9 3.1
29.9	33.75 1.30	15.9 2.2	26.18 .27	15.4 1.8	23.74 .29	59.6 0.4	49.91 .33	64.1 2.7
Feb. 8.8	35.15 1.47	13.9 1.7	26.46 .28	13.7 1.5	24.04 .31	60.0 0.5	50.26 .36	61.7 2.1
18.8	36.70 1.59	12.6 −1.1	26.74 +.29	12.3 −1.2	24.35 +.32	60.5 −0.5	50.64 +.39	59.8 −1.6
28.8	38.32 1.64	11.8 −0.4	27.03 .29	11.4 0.7	24.67 .32	61.0 0.4	51.04 .40	58.5 0.9
Mar. 10.7	39.98 1.63	11.7 +0.2	27.32 .29	10.9 −0.3	24.99 .32	61.4 0.4	51.45 .41	57.9 −0.3
20.7	41.59 1.56	12.2 0.9	27.61 .28	10.8 +0.1	25.30 .31	61.8 0.3	51.85 .40	58.0 +0.4
30.7	43.10 1.45	13.4 1.4	27.88 .27	11.1 0.5	25.61 .30	62.0 0.3	52.25 .38	58.7 1.0
Apr. 9.7	44.48 1.33	15.2 +2.0	28.14 +.25	11.9 +0.9	25.90 +.29	62.3 −0.2	52.62 +.36	60.0 +1.6
19.6	45.66 1.06	17.4 2.4	28.38 .23	13.0 1.3	26.18 .27	62.5 0.2	52.96 .32	61.8 2.1
29.6	46.60 .82	20.0 2.8	28.60 .21	14.4 1.5	26.44 .25	62.6 0.1	53.27 .28	64.1 2.5
May 9.6	47.30 .56	22.9 3.0	28.80 .18	16.1 1.8	26.67 .22	62.7 0.1	53.53 .24	66.8 2.8
19.6	47.73 +.28	26.0 3.1	28.96 .15	17.9 1.9	26.88 .19	62.8 0.1	53.74 .18	69.8 3.1
29.5	47.87 .00	29.2 +3.2	29.10 +.12	19.9 +2.0	27.06 +.16	63.0 −0.1	53.90 +.13	72.9 +3.2
June 8.5	47.72 −.28	32.4 3.1	29.20 .09	21.8 2.0	27.20 .13	63.1 0.1	54.00 .07	76.2 3.2
18.5	47.31 .55	35.5 3.0	29.27 .06	23.8 1.9	27.31 .09	63.2 0.2	54.04 +.01	79.4 3.2
28.4	46.63 .80	38.4 2.8	29.30 +.01	25.7 1.8	27.37 +.04	63.4 0.2	54.02 −.05	82.5 3.0
July 8.4	45.70 1.03	41.1 2.5	29.30 −.03	27.4 1.7	27.40 .00	63.6 0.2	53.94 .11	85.4 2.8
18.4	44.56 1.24	43.4 +2.1	29.25 −.06	29.0 +1.5	27.38 −.04	63.8 −0.2	53.80 −.16	88.1 +2.5
28.4	43.22 1.41	45.3 1.7	29.17 .10	30.3 1.2	27.32 .03	64.0 0.2	53.61 .22	90.4 2.1
Aug. 7.3	41.73 1.56	46.7 1.2	29.06 .13	31.5 1.0	27.22 .12	64.1 0.1	53.37 .26	92.4 1.8
17.3	40.10 1.67	47.7 0.8	28.91 .16	32.4 0.8	27.09 .15	64.2 −0.1	53.09 .30	93.9 1.3
27.3	38.38 1.74	48.3 +0.3	28.74 .18	33.0 0.5	26.93 .17	64.3 0.0	52.77 .33	95.0 0.8
Sept. 6.3	36.62 1.78	48.3 −0.2	28.56 −.19	33.3 +0.2	26.75 −.19	64.3 +0.1	52.43 −.35	95.6 +0.3
16.2	34.83 1.77	47.8 0.7	28.37 .19	33.4 −0.1	26.55 .19	64.2 0.1	52.08 .35	95.7 −0.2
26.2	33.08 1.72	46.8 1.2	28.17 .19	33.1 0.4	26.36 .19	64.0 0.2	51.73 .35	95.3 0.7
Oct. 6.2	31.40 1.63	45.3 1.7	27.99 .17	32.5 0.7	26.18 .17	63.8 0.2	51.38 .33	94.4 1.2
16.1	29.83 1.49	43.4 2.2	27.83 .15	31.7 1.0	26.01 .15	63.6 0.3	51.06 .31	93.0 1.7
26.1	28.41 1.32	41.0 −2.6	27.70 −.11	30.5 −1.3	25.88 −.11	63.3 +0.3	50.77 −.27	91.1 −2.1
Nov. 5.1	27.19 1.10	38.2 2.9	27.60 .07	29.1 1.6	25.79 .07	63.0 0.3	50.53 .21	88.7 2.5
15.1	26.21 .85	35.1 3.2	27.55 −.03	27.3 1.8	25.75 −.02	62.8 0.2	50.34 .16	85.9 2.9
25.0	25.48 .58	31.7 3.4	27.54 +.02	25.4 2.0	25.75 +.03	62.6 +0.1	50.22 .09	82.8 3.2
Dec. 5.0	25.05 −.28	28.2 3.6	27.59 .07	23.2 2.2	25.82 .09	62.5 0.0	50.16 −.02	79.5 3.5
15.0	24.93 +.03	24.6 −3.6	27.68 +.12	20.9 −2.4	25.93 +.14	62.5 −0.1	50.18 +.05	75.9 −3.6
25.0	25.13 .35	21.0 3.5	27.82 .16	18.5 2.4	26.09 .18	62.7 0.2	50.27 .12	72.3 3.6
34.9	25.63 +.67	17.5 −3.4	28.00 +.20	16.1 −2.3	26.29 +.22	62.9 −0.3	50.43 +.18	68.7 −3.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ophiuchi.		ω Draconis.		μ Herculis.		ψ¹ Draconis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 17 29	° ′ +12 38	h m 17 37	° ′ +68 48	h m 17 41	° ′ +27 47	h m 17 43	° ′ +72 12
	s	″	s	″	s	″	s	″
Jan. 0.0	37.07 +.16	44.5 −2.3	33.44 +.17	42.1 −3.6	58.21 +.14	22.5 −2.9	53.58 +.16	20.7 −3.7
9.9	37.25 .20	42.3 2.2	33.66 .28	38.6 3.4	58.38 .19	19.6 2.8	53.81 .29	17.1 3.5
19.9	37.47 .23	40.1 2.0	33.99 .38	35.4 3.2	58.58 .22	16.9 2.6	54.16 .41	13.8 3.2
29.9	37.71 .25	38.2 1.8	34.42 .47	32.3 2.8	58.82 .25	14.4 2.3	54.63 .52	10.8 2.8
Feb. 8.8	37.98 .27	36.5 1.5	34.93 .54	29.8 2.3	59.08 .27	12.3 1.9	55.21 .61	8.2 2.3
18.8	38.26 +.28	35.1 −1.2	35.51 +.60	27.8 −1.7	59.37 +.29	10.6 −1.5	55.86 +.68	6.2 −1.7
28.8	38.54 .29	34.1 0.8	36.13 .63	26.4 1.0	59.67 .30	9.3 1.0	56.57 .73	4.7 1.1
Mar. 10.8	38.83 .29	33.6 −0.4	36.77 .64	25.8 −0.3	59.97 .30	8.6 −0.4	57.32 .75	3.9 −0.4
20.7	39.11 .28	33.4 0.0	37.42 .64	25.7 +0.3	60.27 .30	8.5 +0.1	58.07 .74	3.8 +0.2
30.7	39.39 .27	33.7 +0.5	38.05 .61	26.4 1.0	60.57 .29	8.8 0.6	58.81 .72	4.4 0.9
Apr. 9.7	39.66 +.26	34.4 +0.9	38.64 +.57	27.7 +1.6	60.86 +.28	9.7 +1.1	59.51 +.67	5.6 +1.5
19.7	39.91 .24	35.4 1.2	39.18 .51	29.5 2.1	61.13 .26	11.0 1.5	60.15 .60	7.4 2.0
29.6	40.14 .22	36.7 1.5	39.66 .44	31.9 2.5	61.38 .24	12.8 1.9	60.72 .52	9.6 2.5
May 9.6	40.35 .20	38.3 1.7	40.06 .35	34.6 2.9	61.61 .21	14.9 2.2	61.19 .42	12.3 2.8
19.6	40.54 .17	40.1 1.8	40.37 .26	37.7 3.2	61.80 .18	17.2 2.4	61.55 .31	15.3 3.1
29.5	40.70 +.14	41.9 +1.9	40.58 +.16	40.9 +3.3	61.97 +.15	19.7 +2.5	61.80 +.19	18.5 +3.3
June 8.5	40.82 .11	43.9 1.9	40.69 +.06	44.3 3.4	62.09 .11	22.3 2.6	61.93 +.07	21.9 3.3
18.5	40.91 .07	45.8 1.9	40.70 −.04	47.7 3.3	62.18 .07	24.8 2.5	61.94 −.05	25.2 3.3
28.5	40.96 +.03	47.6 1.8	40.61 .14	50.9 3.2	62.23 +.03	27.3 2.4	61.82 .17	28.4 3.2
July 8.4	40.97 −.01	49.4 1.7	40.41 .24	54.0 3.0	62.23 −.02	29.7 2.3	61.59 .29	31.5 3.0
18.4	40.95 −.05	50.9 +1.5	40.12 −.33	56.8 +2.7	62.19 −.06	31.9 +2.1	61.25 −.40	34.4 +2.7
28.4	40.88 .08	52.3 1.3	39.75 .42	59.3 2.3	62.11 .10	33.8 1.8	60.80 .50	36.9 2.4
Aug. 7.4	40.78 .12	53.5 1.1	39.29 .49	61.4 1.9	61.98 .14	35.5 1.5	60.25 .58	39.1 2.0
17.3	40.65 .15	54.4 0.8	38.77 .55	63.1 1.5	61.83 .17	36.8 1.2	59.63 .66	40.8 1.5
27.3	40.49 .17	55.1 0.5	38.19 .60	64.3 1.0	61.65 .20	37.8 0.8	58.94 .71	42.1 1.0
Sept. 6.3	40.31 −.18	55.5 +0.3	37.58 −.63	65.1 +0.5	61.44 −.21	38.4 +0.4	58.21 −.75	42.9 +0.5
16.2	40.12 .19	55.7 0.0	36.94 .64	65.3 0.0	61.22 .22	38.7 0.0	57.44 .77	43.2 0.0
26.2	39.93 .19	55.5 −0.3	36.29 .64	65.0 −0.5	60.99 .22	38.5 −0.4	56.67 .77	43.0 −0.5
Oct. 6.2	39.74 .18	55.1 0.6	35.66 .62	64.1 1.0	60.77 .21	38.0 0.8	55.91 .75	42.2 1.0
16.2	39.57 .16	54.3 0.9	35.06 .58	62.8 1.6	60.57 .19	37.0 1.2	55.17 .71	40.9 1.5
26.1	39.43 −.13	53.3 −1.1	34.51 −.52	60.9 −2.1	60.39 −.16	35.7 −1.5	54.50 −.64	39.1 −2.0
Nov. 5.1	39.32 .09	52.0 1.4	34.02 .44	58.6 2.6	60.25 .12	33.9 1.9	53.89 .56	36.9 2.5
15.1	39.26 −.04	50.5 1.7	33.62 .36	55.8 2.9	60.14 .08	31.9 2.2	53.38 .45	34.1 2.9
25.1	39.23 .00	48.7 1.9	33.31 .25	52.7 3.3	60.09 −.03	29.4 2.5	52.99 .34	31.1 3.2
Dec. 5.0	39.26 +.05	46.7 2.1	33.11 .14	49.2 3.5	60.08 +.02	26.8 2.7	52.71 .21	27.7 3.5
15.0	39.33 +.10	44.5 −2.2	33.03 −.02	45.6 −3.7	60.12 +.07	24.0 −2.9	52.57 −.07	24.1 −3.6
25.0	39.45 .14	42.2 2.3	33.06 +.09	41.9 3.7	60.21 .12	21.1 2.9	52.57 +.07	20.4 3.7
35.0	39.61 +.18	39.9 −2.3	33.21 +.21	38.3 −3.6	60.36 +.17	18.1 −2.9	52.70 +.20	16.7 −3.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Draconis.		γ² Sagittarii.		μ Sagittarii.		η Serpentis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	$17^{h}\ 53^{m}$	$+51^{\circ}\ 29'$	$17^{h}\ 58^{m}$	$-30^{\circ}\ 25'$	$18^{h}\ 6^{m}$	$-21^{\circ}\ 5'$	$18^{h}\ 15^{m}$	$-\ 2^{\circ}\ 55'$
	s	″	s	″	s	″	s	″
Jan. 0.0	55.31 +.12	75.0 −3.6	27.33 +.18	17.5 +0.3	55.11 +.16	6.1 −0.2	23.15 +.13	30.1 −1.3
9.9	55.46 .19	71.5 3.4	27.53 .22	17.2 0.2	55.29 .20	6.3 0.3	23.30 .17	31.4 1.3
19.9	55.68 .24	68.2 3.2	27.77 .25	17.0 0.2	55.50 .23	6.6 0.3	23.48 .20	32.7 1.2
29.9	55.96 .29	65.2 2.8	28.04 .28	16.9 +0.1	55.75 .25	6.9 0.3	23.69 .23	33.9 1.1
Feb. 8.9	56.27 .34	62.6 2.4	28.33 .30	16.8 0.0	56.01 .28	7.1 0.2	23.93 .25	35.0 0.9
18.8	56.62 +.37	60.5 −1.8	28.64 +.32	16.8 0.0	56.30 +.29	7.4 −0.2	24.18 +.26	35.9 −0.7
28.8	57.00 .39	59.0 1.2	28.97 .33	16.8 0.0	56.59 .30	7.6 0.1	24.45 .27	36.5 0.5
Mar. 10.8	57.40 .40	58.1 −0.6	29.30 .33	16.8 0.0	56.90 .31	7.6 −0.1	24.73 .28	36.9 −0.2
20.8	57.80 .40	57.8 +0.1	29.63 .33	16.8 0.0	57.21 .31	7.7 0.0	25.01 .28	37.1 +0.1
30.7	58.20 .39	58.2 0.7	29.96 .33	16.9 −0.1	57.51 .30	7.6 +0.1	25.30 .28	36.9 0.3
Apr. 9.7	58.58 +.37	59.3 +1.3	30.29 +.32	17.0 −0.1	57.82 +.30	7.4 +0.2	25.58 +.28	36.5 +0.6
19.7	58.93 .34	60.9 1.9	30.60 .31	17.0 0.1	58.11 .29	7.2 0.2	25.85 .26	35.8 0.8
29.6	59.26 .31	63.0 2.3	30.90 .29	17.1 0.1	58.39 .27	6.9 0.3	26.11 .25	35.0 1.0
May 9.6	59.55 .26	65.5 2.7	31.18 .27	17.3 0.2	58.66 .25	6.6 0.3	26.36 .24	33.9 1.2
19.6	59.79 .22	68.4 3.0	31.44 .24	17.5 0.2	58.90 .23	6.3 0.3	26.58 .21	32.8 1.2
29.6	59.98 +.17	71.5 +3.1	31.66 +.21	17.8 −0.3	59.12 +.20	6.1 +0.3	26.79 +.19	31.6 +1.3
June 8.5	60.12 .11	74.7 3.2	31.85 .17	18.1 0.4	59.30 .17	5.8 0.2	26.96 .16	30.3 1.3
18.5	60.20 +.05	78.0 3.2	32.01 .13	18.5 0.4	59.45 .13	5.6 0.1	27.10 .12	29.1 1.3
28.5	60.22 −.01	81.2 3.1	32.12 .09	19.0 0.5	59.56 .09	5.5 +0.1	27.20 .08	27.9 1.2
July 8.5	60.18 .07	84.2 3.0	32.18 +.04	19.5 0.5	59.63 +.05	5.5 0.0	27.27 +.04	26.9 1.1
18.4	60.08 −.13	87.1 +2.7	32.20 −.01	20.0 −0.5	59.66 .00	5.5 0.0	27.29 .00	25.9 +1.0
28.4	59.93 .18	89.6 2.4	32.17 .05	20.6 0.5	59.64 −.04	5.6 −0.1	27.27 −.04	25.1 0.8
Aug. 7.4	59.72 .23	91.9 2.0	32.09 .10	21.1 0.5	59.57 .08	5.7 0.1	27.21 .08	24.3 0.7
17.3	59.46 .27	93.7 1.6	31.97 .14	21.6 0.4	59.47 .12	5.8 0.1	27.12 .11	23.8 0.6
27.3	59.17 .31	95.1 1.2	31.82 .17	22.0 0.3	59.33 .15	6.0 0.1	26.99 .14	23.4 0.4
Sept. 6.3	58.84 −.33	96.0 +0.7	31.64 −.19	22.3 −0.2	59.17 −.17	6.1 −0.1	26.83 −.16	23.1 +0.3
16.3	58.50 .35	96.5 +0.2	31.44 .20	22.5 −0.1	58.99 .19	6.2 −0.1	26.66 .18	23.0 +0.1
26.2	58.15 .35	96.4 −0.3	31.23 .21	22.5 0.0	58.80 .19	6.3 0.0	26.48 .18	23.0 0.0
Oct. 6.2	57.80 .34	95.9 0.8	31.03 .20	22.4 +0.1	58.60 .18	6.3 0.0	26.29 .18	23.2 −0.2
16.2	57.47 .32	94.8 1.3	30.83 .18	22.2 0.3	58.43 .17	6.3 0.0	26.12 .16	23.5 0.3
26.2	57.17 −.28	93.2 −1.8	30.67 −.15	21.9 +0.4	58.27 −.14	6.3 0.0	25.97 −.14	24.0 −0.5
Nov. 5.1	56.91 .24	91.2 2.3	30.54 .10	21.5 0.4	58.15 .10	6.2 0.0	25.84 .11	24.6 0.6
15.1	56.70 .18	88.7 2.7	30.46 −.06	21.0 0.5	58.07 .06	6.2 0.0	25.75 .07	25.4 0.8
25.1	56.54 .12	85.8 3.0	30.43 .00	20.5 0.5	58.03 −.01	6.2 0.0	25.70 −.03	26.3 0.9
Dec. 5.0	56.46 −.06	82.6 3.3	30.45 +.06	20.0 0.5	58.04 +.04	6.2 −0.1	25.70 +.02	27.4 1.0
15.0	56.43 +.01	79.2 −3.5	30.52 +.10	19.6 +0.4	58.10 +.08	6.3 −0.1	25.74 +.06	28.6 −1.1
25.0	56.48 .08	75.6 3.6	30.65 .15	19.2 0.3	58.21 .13	6.5 0.2	25.83 .11	29.9 1.2
35.0	56.60 +.15	72.0 −3.5	30.83 +.20	18.9 +0.3	58.37 +.17	6.7 −0.2	25.95 +.15	30.2 −1.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	1 Aquilæ.		σ Octantis.		α Lyræ. (*Vega.*)		β Lyræ.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 18 28	− 8° 19′	h m 18	−89° 15′	h m 18 33	+38° 40′	h m 18 45	+33° 13′
	s	″	m s	″	s	″	s	″
Jan. 0.0	58.66 +.13	14.5 −0.9	33 17.4+ 4.4	65.0 +3.4	2.97 +.08	48.8 −3.2	50.62 +.07	59.1 −3.0
10.0	58.80 .16	15.4 0.9	33 23.5 7.7	61.7 3.2	3.07 .13	45.6 3.1	50.72 .12	56.2 2.9
19.9	58.98 .19	16.4 0.8	33 32.6 10.6	58.6 3.0	3.23 .18	42.5 3.0	50.86 .16	53.3 2.8
29.9	59.19 .22	17.2 0.8	33 44.5 13.2	55.8 2.7	3.43 .22	39.6 2.7	51.04 .20	50.5 2.6
Feb. 8.9	59.42 .24	18.0 0.6	33 58.8 15.3	53.2 2.3	3.67 .25	37.1 2.4	51.26 .23	48.0 2.2
18.8	59.67 +.26	18.6 −0.5	34 15.0+17.1	51.1 +1.9	3.94 +.28	34.9 −1.9	51.50 +.26	46.0 −1.8
28.8	59.94 .27	19.1 0.3	34 32.8 18.4	49.4 1.5	4.23 .30	33.2 1.4	51.78 .28	44.3 1.3
Mar. 10.8	60.22 .28	19.3 −0.1	34 51.7 19.3	48.1 1.0	4.55 .32	32.1 0.8	52.07 .30	43.2 0.8
20.8	60.50 .29	19.4 +0.1	35 11.3 19.8	47.4 +0.5	4.87 .33	31.6 −0.3	52.38 .31	42.6 −0.2
30.7	60.79 .29	19.1 0.4	35 31.1 19.8	47.1 0.0	5.20 .33	31.6 +0.4	52.69 .31	42.6 +0.3
Apr. 9.7	61.08 +.28	18.7 +0.6	35 50.7+19.4	47.3 −0.4	5.54 +.33	32.3 +0.9	53.00 +.31	43.1 +0.9
19.7	61.36 .28	18.1 0.7	36 9.7 18.6	48.0 0.9	5.86 .31	33.5 1.5	53.31 .30	44.2 1.4
29.7	61.63 .27	17.4 0.9	36 27.8 17.5	49.1 1.3	6.16 .29	35.2 1.9	53.61 .29	45.8 1.8
May 9.6	61.89 .25	16.5 1.0	36 44.6 16.0	50.7 1.7	6.45 .27	37.3 2.3	53.89 .27	47.7 2.2
19.6	62.13 .23	15.5 1.1	36 59.6 14.1	52.7 2.1	6.70 .24	39.8 2.6	54.15 .24	50.1 2.5
29.6	62.35 +.20	14.5 +1.1	37 12.7+11.9	55.0 −2.4	6.92 +.20	42.6 +2.8	54.37 +.21	52.7 +2.8
June 8.5	62.54 .17	13.5 1.1	37 23.4 9.5	57.7 2.7	7.10 .16	45.5 2.9	54.57 .17	55.5 2.9
18.5	62.70 .14	12.5 1.0	37 31.5 6.7	60.5 2.9	7.24 .11	48.6 3.0	54.72 .13	58.3 3.0
28.5	62.82 .10	11.6 1.0	37 36.8 3.8	63.5 3.0	7.33 .07	51.6 3.0	54.83 .08	61.2 2.9
July 8.5	62.90 .06	10.8 0.9	37 39.4+ 0.9	66.6 3.1	7.37 +.02	54.6 2.9	54.89 +.04	64.1 2.8
18.4	62.94 +.02	10.1 +0.7	37 38.5− 2.2	69.7 −3.0	7.36 −.03	57.4 +2.7	54.90 −.01	66.8 +2.7
28.4	62.94 −.02	9.5 0.6	37 34.9 5.1	72.6 2.9	7.30 .08	60.0 2.5	54.86 .06	69.3 2.5
Aug. 7.4	62.89 .06	9.0 0.5	37 28.3 8.0	75.5 2.7	7.19 .13	62.3 2.2	54.78 .10	71.6 2.2
17.4	62.81 .10	8.6 0.4	37 19.0 10.6	78.0 2.3	7.04 .17	64.4 1.8	54.66 .14	73.5 1.9
27.3	62.69 .13	8.4 0.3	37 7.3 12.8	80.2 1.9	6.84 .21	66.0 1.5	54.49 .18	75.2 1.5
Sept. 6.3	62.54 −.16	8.2 +0.2	36 53.6−14.6	81.8 −1.4	6.62 −.24	67.3 +1.0	54.30 −.21	80.5 +1.2
16.3	62.37 .17	8.2 +0.1	36 38.2 15.9	83.0 0.9	6.37 .25	68.1 0.6	54.08 .23	77.3 0.8
26.2	62.19 .18	8.3 0.0	36 22.0 16.5	83.6 −0.3	6.11 .26	68.5 +0.2	53.84 .24	77.8 +0.3
Oct. 6.2	62.01 .18	8.4 −0.1	36 5.3 16.6	83.6 +0.3	5.84 .26	68.4 −0.3	53.60 .24	77.8 −0.1
16.2	61.83 .17	8.6 0.2	35 48.9 16.0	83.0 0.8	5.59 .25	67.9 0.8	53.36 .23	77.4 0.5
26.2	61.68 −.14	9.0 −0.3	35 33.5−14.7	81.7 +1.5	5.35 −.23	66.8 −1.2	53.14 −.21	76.5 −1.0
Nov. 5.1	61.55 .11	9.4 0.4	35 19.7 12.8	80.0 2.0	5.13 .20	65.4 1.7	52.94 .18	75.2 1.4
15.1	61.45 .07	9.9 0.5	35 8.0 10.4	77.8 2.4	4.96 .15	63.5 2.1	52.77 .15	73.5 1.8
25.1	61.40 −.03	10.6 0.6	34 59.0 7.5	75.1 2.8	4.82 .11	61.2 2.5	52.65 .10	71.5 2.1
Dec. 5.1	61.38 +.01	11.3 0.7	34 53.1 4.4	72.1 3.1	4.74 −.06	58.5 2.8	52.57 .06	69.0 2.4
15.0	61.42 +.06	12.2 −0.8	34 50.3− 1.0	68.9 +3.2	4.71 .00	55.6 −3.0	52.53 −.01	66.3 −2.7
25.0	61.49 .10	13.1 0.8	34 51.0+ 2.4	65.5 3.3	4.73 +.05	52.5 3.1	52.55 +.04	63.4 2.8
35.0	61.61 +.14	14.0 −0.9	34 55.0+ 5.7	62.2 +3.3	4.80 +.10	49.3 −3.2	52.62 +.09	60.5 −2.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ Sagittarii.		50 Draconis.		ζ Aquilæ.		*d* Sagittarii.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	$18^{h}\ 48^{m}$	$-26^{\circ}\ 26'$	$18^{h}\ 49^{m}$	$+75^{\circ}\ 17'$	$19^{h}\ 0^{m}$	$+13^{\circ}\ 41'$	$19^{h}\ 10^{m}$	$-19^{\circ}\ 9'$
	s	″	s	″	s	″	s	″
Jan. 0.0	10.01 +.12	6.6 +0.3	57.97 −.08	66.4 −3.6	8.74 +.07	49.0 −2.1	56.20 +.09	10.8 −0.1
10.0	10.15 .16	6.3 0.3	57.96 +.08	62.8 3.5	8.84 .11	47.0 2.1	56.31 .13	10.9 0.1
20.0	10.33 .20	6.1 0.2	58.12 .24	59.3 3.4	8.97 .15	44.9 2.0	56.46 .16	11.0 0.1
29.9	10.54 .23	5.9 0.2	58.45 .40	55.9 3.2	9.14 .18	43.0 1.8	56.64 .19	11.1 −0.1
Feb. 8.9	10.79 .26	5.6 0.2	58.92 .54	52.9 2.9	9.33 .21	41.2 1.6	56.85 .22	11.1 0.0
18.9	11.05 +.28	5.4 +0.3	59.53 +.66	50.2 −2.4	9.55 +.23	39.8 −1.3	57.09 +.25	11.1 +0.1
28.8	11.34 .29	5.1 0.3	60.24 .76	48.0 1.9	9.80 .25	38.6 1.0	57.34 .27	10.9 0.2
Mar. 10.8	11.64 .31	4.8 0.3	61.04 .83	46.4 1.3	10.06 .27	37.9 0.5	57.62 .28	10.7 0.3
20.8	11.95 .31	4.4 0.4	61.90 .87	45.5 −0.6	10.33 .28	37.5 −0.1	57.90 .29	10.3 0.4
30.8	12.27 .32	4.0 0.4	62.79 .89	45.2 0.0	10.61 .28	37.6 +0.3	58.20 .30	9.8 0.5
Apr. 9.7	12.59 +.32	3.6 +0.4	63.67 +.87	45.5 +0.7	10.90 +.28	38.1 +0.7	58.51 +.30	9.2 +0.6
19.7	12.91 .31	3.2 0.4	64.52 .83	46.5 1.3	11.18 .28	39.0 1.1	58.81 .30	8.5 0.7
29.7	13.22 .31	2.8 0.4	65.32 .76	48.1 1.8	11.46 .27	40.3 1.4	59.11 .30	7.8 0.7
May 9.7	13.52 .29	2.4 0.3	66.04 .67	50.2 2.3	11.73 .26	41.9 1.7	59.41 .29	7.0 0.8
19.6	13.81 .27	2.1 0.3	66.65 .55	52.7 2.7	11.98 .24	43.7 1.9	59.69 .27	6.3 0.7
29.6	14.07 +.25	1.9 +0.2	67.15 +.43	55.6 +3.0	12.21 +.22	45.7 +2.0	59.95 +.25	5.6 +0.7
June 8.6	14.30 .21	1.7 +0.1	67.51 .29	58.7 3.2	12.41 .19	47.8 2.1	60.19 .22	4.9 0.6
18.5	14.49 .17	1.7 0.0	67.73 +.15	62.1 3.4	12.58 .15	50.0 2.2	60.39 .19	4.4 0.5
28.5	14.65 .14	1.7 −0.1	67.81 .00	65.5 3.4	12.71 .11	52.1 2.1	60.56 .15	3.9 0.4
July 8.5	14.76 .09	1.9 0.2	67.73 −.15	68.9 3.4	12.81 .07	54.2 2.0	60.69 .11	3.6 0.3
18.5	14.83 +.04	2.2 −0.3	67.51 −.29	72.2 +3.2	12.86 +.03	56.2 +1.9	60.78 +.06	3.4 +0.1
28.4	14.85 .00	2.6 0.4	67.15 .43	75.3 3.0	12.87 −.01	57.9 1.7	60.81 +.01	3.4 0.0
Aug. 7.4	14.82 −.05	3.0 0.4	66.65 .55	78.2 2.7	12.83 .06	59.5 1.5	60.81 −.03	3.4 −0.1
17.4	14.74 .09	3.4 0.5	66.04 .67	80.7 2.4	12.75 .10	60.9 1.3	60.75 .07	3.5 0.2
27.4	14.63 .13	3.9 0.5	65.32 .76	82.9 2.0	12.64 .13	62.0 1.0	60.66 .11	3.7 0.2
Sept. 6.3	14.48 −.16	4.3 −0.4	64.51 −.84	84.7 +1.5	12.49 −.16	62.9 +0.7	60.53 −.14	4.0 −0.3
16.3	14.30 .19	4.7 0.3	63.64 .90	86.0 1.0	12.32 .18	63.5 0.4	60.37 .17	4.3 0.3
26.3	14.10 .20	5.0 0.3	62.72 .93	86.8 +0.5	12.13 .19	63.8 +0.2	60.19 .18	4.6 0.3
Oct. 6.2	13.91 .20	5.2 0.2	61.77 .94	87.1 0.0	11.94 .19	63.8 −0.1	60.01 .19	4.8 0.3
16.2	13.71 .19	5.3 −0.1	60.83 .93	86.9 −0.5	11.75 .18	63.5 0.4	59.82 .18	5.1 0.2
26.2	13.53 −.16	5.3 0.0	59.91 −.89	86.1 −1.0	11.57 −.17	62.9 −0.7	59.65 −.16	5.3 −0.2
Nov. 5.2	13.38 .13	5.3 +0.1	59.05 .83	84.8 1.5	11.41 .14	62.0 1.0	59.50 .14	5.5 0.2
15.1	13.27 .10	5.1 0.2	58.26 .74	83.0 2.1	11.28 .11	60.8 1.3	59.37 .10	5.7 0.2
25.1	13.19 −.05	4.9 0.2	57.57 .63	80.7 2.6	11.19 .07	59.4 1.6	59.29 .06	5.8 0.2
Dec. 5.1	13.16 .00	4.7 0.2	57.00 .50	77.9 2.9	11.13 −.03	57.7 1.8	59.24 −.02	6.0 0.2
15.1	13.19 +.05	4.4 +0.3	56.57 −.35	74.8 −3.2	11.12 +.01	55.8 −2.0	59.24 +.02	6.1 −0.2
25.0	13.26 .09	4.2 0.2	56.30 .19	71.4 3.5	11.15 .05	53.8 2.1	59.28 .06	6.3 0.2
35.0	13.37 +.13	3.9 +0.2	56.19 −.03	67.9 −3.8	11.22 +.09	51.7 −2.1	59.37 +.11	6.5 −0.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Draconis.		τ Draconis.		δ Aquilæ.		κ Aquilæ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	19h 12m	+67° 27′	19h 17m	+73° 8′	19h 19m	+ 2° 53′	19h 30m	− 7° 16′
	s	″	s	″	s	″	s	″
Jan. 0.0	28.60 −.07	50.8 −3.5	40.63 −.15	48.5 −3.5	43.54 +.06	25.1 −1.5	43.95 +.06	41.7 −0.8
10.0	28.58 +.03	47.3 3.5	40.55 −.01	45.0 3.5	43.63 .10	23.7 1.4	44.03 .10	42.5 0.8
20.0	28.66 .14	43.7 3.4	40.62 +.13	41.5 3.5	43.75 .14	22.2 1.4	44.15 .13	43.3 0.8
29.9	28.86 .24	40.3 3.3	40.82 .27	38.0 3.3	43.90 .17	20.9 1.3	44.30 .16	44.0 0.7
Feb. 8.9	29.15 .34	37.1 3.0	41.16 .40	34.8 3.1	44.09 .20	19.7 1.1	44.48 .19	44.6 −0.5
18.9	29.53 +.42	34.3 −2.6	41.63 +.52	31.9 −2.7	44.29 +.22	18.7 −0.9	44.69 +.22	45.1 −0.4
28.9	29.99 .49	31.9 2.1	42.20 .61	29.5 2.2	44.52 .24	18.0 0.6	44.92 .24	45.4 −0.2
Mar. 10.8	30.51 .54	30.1 1.5	42.86 .69	27.6 1.7	44.77 .26	17.6 −0.3	45.16 .26	45.4 +0.1
20.8	31.08 .58	28.9 0.9	43.58 .75	26.3 1.0	45.04 .27	17.5 +0.1	45.43 .27	45.2 0.3
30.8	31.68 .60	28.3 −0.2	44.35 .77	25.6 −0.3	45.31 .28	17.7 0.4	45.70 .28	44.8 0.5
Apr. 9.7	32.29 +.60	28.4 +0.4	45.13 +.78	25.6 +0.3	45.59 +.28	18.2 +0.7	45.99 +.29	44.2 +0.7
19.7	32.89 .59	29.2 1.1	45.91 .76	26.3 1.0	45.88 .28	19.1 1.0	46.28 .29	43.4 0.9
29.7	33.46 .55	30.6 1.6	46.64 .71	27.5 1.6	46.16 .28	20.2 1.2	46.57 .29	42.4 1.1
May 9.7	33.99 .50	32.5 2.2	47.33 .65	29.3 2.1	46.44 .27	21.6 1.4	46.85 .28	41.2 1.2
19.6	34.47 .44	34.9 2.6	47.94 .56	31.7 2.5	46.70 .25	23.1 1.6	47.13 .27	40.0 1.3
29.6	34.88 +.37	37.7 +3.0	48.45 +.46	34.4 +2.9	46.95 +.23	24.7 +1.7	47.39 +.25	38.7 +1.3
June 8.6	35.20 .28	40.8 3.3	48.86 .35	37.4 3.2	47.17 .21	26.4 1.7	47.62 .22	37.4 1.3
18.6	35.44 .19	44.1 3.4	49.15 .23	40.7 3.3	47.36 .18	28.1 1.7	47.83 .19	36.1 1.2
28.5	35.58 +.09	47.6 3 5	49.32 +.10	44.1 3.4	47.52 .14	29.8 1.6	48.01 .16	35.0 1.1
July 8.5	35.62 −.01	51.0 3.4	49.35 −.03	47.6 3.4	47.64 .10	31.4 1.5	48.14 .11	33.9 1.0
18.5	35.56 −.10	54.5 +3.4	49.26 −.16	51.0 +3.4	47.72 +.06	32.8 +1.4	48.24 +.07	33.0 +0.9
28.4	35.41 .20	57.8 3.2	49.04 .28	54.3 3.2	47.75 +.01	34.2 1.2	48.29 +.03	32.2 0.7
Aug. 7.4	35.16 .29	60.8 2.9	48.69 .40	57.4 3.0	47.74 −.03	35.3 1.1	48.29 −.02	31.5 0.5
17.4	34.84 .37	63.6 2.6	48.23 .51	60.3 2.7	47.69 .07	36.3 0.9	48.26 .06	31.1 0.4
27.4	34.41 .45	66.0 2.3	47.67 .60	62.8 2.3	47.60 .11	37.1 0.7	48.18 .10	30.7 0.3
Sept. 6.3	33.93 −.51	68.1 +1.8	47.03 −.68	64.9 +1.9	47.47 −.14	37.6 +0.5	48.06 −.13	30.6 +0.1
16.3	33.40 .55	69 7 1.4	46.31 .74	66.7 1.5	47.32 .16	38.0 0.3	47.92 .15	30.5 0.0
26.3	32.82 .59	70.8 0.9	45.54 .79	67.9 1.0	47.15 .17	38.1 +0.1	47.76 .17	30.6 −0.1
Oct. 6.3	32.23 .60	71.4 +0.3	44.74 .81	68.6 +0.5	46.98 .18	38.1 −0.1	47.58 .18	30.8 0.2
16.2	31.62 .60	71.5 −0.2	43.92 .81	68.8 −0.1	46.80 .17	37.9 0.3	47.41 .17	31.0 0.3
26.2	31.03 −.58	71.0 −0.8	43.11 −.79	68.5 −0.6	46.63 −.16	37.4 −0.5	47.24 −.16	31.4 −0.4
Nov. 5.2	30.47 .54	70.0 1.3	42.34 .75	67.6 1.2	46.47 .14	36.8 0.7	47.08 .14	31.9 0.5
15.1	29.95 .49	68.4 1.8	41.62 .68	66.1 1.7	46.35 .11	36.0 0.9	46.96 .11	32.4 0.6
25.1	29.50 .42	66.3 2.3	40.98 .60	64.2 2.2	46.25 .08	35.0 1.1	46.86 .08	33.0 0.7
Dec. 5.1	29.12 .33	63.8 2.7	40.43 .49	61.7 2.7	46.20 −.04	33.8 1.2	46.80 −.04	33.7 0.7
15.1	28.83 −.24	60.8 −3.1	39.99 −.37	58.8 −3.0	46.18 .00	32.5 −1.3	46.78 .00	34.5 −0.8
25.0	28.64 .14	57.6 3.3	39.68 .24	55.6 3.3	46.20 +.04	31.1 1.4	46.80 +.04	35.3 0.8
35.0	28.55 −.04	54.1 −3.6	39.51 −.11	52.2 −3.5	46.26 +.08	29.7 −1.5	46.86 +.08	36.2 −0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Aquilæ.		α Aquilæ. (*Altair.*)		ε Draconis.		β Aquilæ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 19 40	+10° 20′	h m 19 45	+ 8° 34′	h m 19 48	+69° 58′	h m 19 49	+ 6° 7′
	s	″	s	″	s	″	s	″
Jan. 0.0	48.97 +.04	17.8 −1.8	11.85 +.04	12.0 −1.7	30.20 −.19	52.8 −3.3	41.39 +.03	28.8 −1.6
10.0	49.03 .08	16.0 1.8	11.91 .07	10.4 1.7	30.07 −.07	49.4 3.4	41.44 .07	27.2 1.5
20.0	49.12 .11	14.3 1.7	12.00 .11	8.7 1.6	30.05 +.04	45.9 3.5	41.53 .10	25.7 1.5
30.0	49.25 .14	12.6 1.6	12.13 .14	7.1 1.5	30.16 .16	42.4 3.4	41.65 .14	24.3 1.4
Feb. 8.9	49.41 .17	11.0 1.4	12.29 .17	5.7 1.4	30.38 .29	39.1 3.2	41.81 .17	22.9 1.2
18.9	49.60 +.20	9.7 −1.1	12.47 +.20	4.5 −1.1	30.71 +.38	36.0 −2.9	41.99 +.19	21.8 −1.0
28.9	49.82 .22	8.7 0.8	12.68 .22	3.5 0.8	31.14 .47	33.3 2.4	42.20 .22	21.0 0.7
Mar. 10.9	50.05 .24	8.0 0.5	12.92 .24	2.9 0.4	31.66 .55	31.1 1.9	42.43 .24	20.4 −0.4
20.8	50.30 .26	7.7 −0.1	13.17 .26	2.7 −0.1	32.24 .61	29.5 1.3	42.68 .26	20.2 0.0
30.8	50.57 .27	7.8 +0.3	13.44 .27	2.8 +0.3	32.87 .65	28.5 0.8	42.94 .27	20.4 +0.3
Apr. 9.8	50.85 +.28	8.2 +0.6	13.72 +.28	3.3 +0.7	33.54 +.67	28.1 −0.1	43.22 +.28	20.8 +0.7
19.7	51.14 .29	9.0 1.0	14.00 .29	4.1 1.0	34.21 .67	28.4 +0.6	43.50 .29	21.7 1.0
29.7	51.43 .28	10.2 1.3	14.29 .29	5.3 1.3	34.87 .64	29.3 1.2	43.79 .29	22.8 1.3
May 9.7	51.71 .27	11.7 1.6	14.58 .28	6.7 1.6	35.50 .60	30.8 1.8	44.07 .28	24.2 1.5
19.7	51.98 .26	13.4 1.8	14.85 .27	8.4 1.8	36.08 .55	32.8 2.3	44.35 .27	25.8 1.7
29.6	52.24 +.24	15.3 +1.9	15.11 +.25	10.3 +1.9	36.59 +.47	35.3 +2.7	44.61 +.25	27.6 +1.8
June 8.6	52.47 .22	17.3 2.0	15.35 .23	12.2 2.0	37.03 .39	38.2 3.0	44.85 .23	29.5 1.9
18.6	52.68 .19	19.4 2.1	15.56 .19	14.3 2.0	37.37 .29	41.4 3.3	45.07 .20	31.4 1.9
28.6	52.85 .15	21.5 2.1	15.74 .16	16.3 2.0	37.60 .18	44.8 3.4	45.25 .16	33.2 1.8
July 8.5	52.98 .11	23.5 2.0	15.87 .12	18.2 1.9	37.74 +.07	48.3 3.5	45.39 .12	35.1 1.8
18.5	53.07 +.07	25.4 +1.8	15.97 +.08	20.1 +1.8	37.76 −.03	51.8 +3.5	45.49 +.08	36.8 +1.6
28.5	53.12 +.03	27.2 1.7	16.03 +.03	21.8 1.6	37.67 .14	55.3 3.4	45.55 +.04	38.3 1.5
Aug. 7.4	53.12 −.02	28.8 1.5	16.03 −.01	23.3 1.4	37.47 .25	58.6 3.3	45.57 −.01	39.7 1.3
17.4	53.08 .06	30.1 1.3	16.00 .05	24.6 1.2	37.17 .35	61.7 3.0	45.54 .05	40.9 1.1
27.4	53.00 .10	31.3 1.0	15.93 .09	25.7 1.0	36.78 .44	64.5 2.7	45.47 .09	41.9 0.9
Sept. 6.4	52.88 −.13	32.2 +0.8	15.82 −.13	26.6 +0.7	36.30 −.51	67.0 +2.3	45.36 −.12	42.6 +0.6
16.3	52.74 .16	32.9 0.5	15.68 .15	27.2 0.5	35.76 .57	69.1 1.9	45.22 .15	43.2 0.4
26.3	52.57 .17	33.3 +0.3	15.51 .17	27.6 +0.3	35.15 .62	70.8 1.4	45.06 .17	43.4 +0.2
Oct. 6.3	52.39 .18	33.4 0.0	15.34 .18	27.7 0.0	34.51 .66	71.9 0.9	44.89 .18	43.5 0.0
16.3	52.21 .18	33.3 −0.3	15.16 .18	27.6 −0.2	33.84 .67	72.6 +0.4	44.71 .18	43.3 −0.3
26.2	52.03 −.17	32.9 −0.5	14.98 −.17	27.2 −0.5	33.17 −.66	72.7 −0.2	44.54 −.17	43.0 −0.5
Nov. 5.2	51.87 .15	32.2 0.8	14.82 .15	26.6 0.7	32.52 .64	72.2 0.7	44.38 .15	42.4 0.7
15.2	51.72 .13	31.3 1.0	14.68 .13	25.7 1.0	31.89 .60	71.2 1.3	44.24 .13	41.6 0.9
25.1	51.61 .10	30.2 1.2	14.57 .10	24.7 1.2	31.33 .53	69.6 1.8	44.13 .10	40.5 1.1
Dec. 5.1	51.53 .06	28.8 1.4	14.49 .06	23.4 1.4	30.83 .46	67.5 2.3	44.05 .06	39.3 1.3
15.1	51.49 −.02	27.2 −1.6	14.45 −.02	21.9 −1.5	30.41 −.36	65.0 −2.8	44.00 −.03	38.0 −1.4
25.1	51.49 +.02	25.5 1.7	14.44 +.01	20.4 1.6	30.10 .26	62.0 3.1	44.00 +.01	36.5 1.5
35.0	51.52 +.06	23.8 −1.8	14.47 +.05	18.7 −1.7	29.89 −.16	58.7 −3.4	44.03 +.05	35.0 −1.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	τ Aquilæ.		α^2 Capricorni.		κ Cephei.		α Pavonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	$19^{h}\ 58^{m}$	$+\ 6^{\circ}\ 57'$	$20^{h}\ 11^{m}$	$-12^{\circ}\ 53'$	$20^{h}\ 12^{m}$	$+77^{\circ}\ 21'$	$20^{h}\ 16^{m}$	$-57^{\circ}\ 5'$
	s	″	s	″	s	″	s	″
Jan. 0.1	32.90 +.03	31.8 −1.5	42.22 +.03	46.4 −0.4	38.62 −.46	78.8 −3.0	34.76 .00	57.1 +2.1
10.0	32.94 .06	30.3 1.6	42.27 .06	46.8 0.4	38.25 .28	75.6 3.2	34.80 +.07	54.9 2.3
20.0	33.02 .10	28.7 1.5	42.35 .10	47.1 0.3	38.07 −.09	72.3 3.4	34.90 .14	52.6 2.3
30.0	33.14 .13	27.3 1.4	42.46 .13	47.4 0.2	38.07 +.10	68.8 3.4	35.08 .20	50.2 2.4
Feb. 9.0	33.28 .16	25 9 1.2	42.61 .16	47.5 −0.1	38.26 .29	65.4 3.3	35.31 .26	47.9 2.3
18.9	33.46 +.19	24.8 −1.0	42.78 +.19	47.5 +0.1	38.64 +.46	62.2 −3.0	35.60 +.31	45.6 +2.3
28.9	33.66 .21	23.9 0.7	42.98 .21	47.4 0.2	39.19 .62	59.3 2.7	35.93 .36	43.4 2.2
Mar. 10.9	33.88 .23	23.4 −0.4	43.21 .24	47.1 0.4	39.89 .76	56.9 2.2	36.32 .40	41.3 2.0
20.8	34.12 .25	23.2 0.0	43.45 .26	46.6 0.6	40.71 .87	54.9 1.7	36.74 .44	39.4 1.8
30.8	34.38 .27	23.3 +0.3	43.72 .27	45.9 0.8	41.63 .95	53.5 1.1	37.19 .46	37.7 1.6
Apr. 9.8	34.66 +.26	23.8 +0.7	44.00 +.29	45.0 +0.9	42.61 1.00	52.8 −0.4	37.66 +.49	36.2 +1.3
19.8	34.94 .29	24.6 1.0	44.29 .30	44.0 1.1	43.62 1.01	52.6 +0.2	38.16 .50	35.1 1.0
29.7	35.23 .29	25.8 1.3	44.59 .30	42.9 1.2	44.63 .99	53.2 0.8	38.67 .51	34.2 0.7
May 9.7	35.52 .28	27.2 1.5	44.89 .30	41.7 1.2	45.61 .94	54.3 1.4	39.17 .50	33.7 +0.4
19.7	35.80 .27	28.8 1.7	45.19 .29	40.4 1.3	46.52 .86	56.0 1.9	39.67 .49	33.5 0.0
29.7	36.06 +.26	30.6 +1.9	45.48 +.28	39.2 +1.2	47.33 +.76	58.1 +2.4	40.15 +.46	33.7 −0.3
June 8.6	36.31 .23	32.6 1.9	45.74 .26	37.9 1.2	48.02 .63	60.8 2.8	40.59 .43	34.2 0.7
18.6	36.53 .20	34.5 2.0	45.99 .23	36.8 1.1	48.59 .48	63.7 3.1	41.00 .38	35.1 1.0
28.6	36.72 .17	36.5 1.9	46.20 .20	35.8 1.0	49.00 .33	67.0 3.3	41.36 .32	36.2 1.3
July 8.5	36.87 .13	38.4 1.8	46.38 .16	34.9 0.8	49.24 +.16	70.4 3.5	41.65 .26	37.7 1.6
18.5	36.98 +.09	40.1 +1.7	46.51 +.11	34.2 +0.6	49.32 .00	73.9 +3.5	41.87 +.19	39.4 −1.8
28.5	37.04 +.04	41.8 1.5	46.61 .07	33.6 0.5	49.23 −.17	77.4 3.5	42.02 .11	41.3 2.0
Aug. 7.5	37.07 .00	43.2 1.4	46.65 +.02	33.2 0.3	48.98 .34	80.8 3.4	42.09 +.03	43.4 2.1
17.4	37.04 −.04	44.5 1.2	46.65 −.02	33.0 +0.1	48.56 .49	84.1 3.2	42.08 −.05	45.4 2.1
27.4	36.98 .08	45.6 0.9	46.61 .06	32.9 0.0	48.00 .63	87.2 2.9	41.99 .12	47.5 2.0
Sept. 6.4	36.88 −.12	46.4 +0.7	46.52 −.10	33.0 −0.1	47.30 −.76	90.0 +2.6	41.84 −.19	49.4 −1.9
16.4	36.75 .14	47.0 0.5	46.41 .13	33.2 0.2	46.48 .87	92.4 2.3	41.62 .25	51.2 1.7
26.3	36.60 .16	47.4 +0.2	46.26 .15	33.5 0.3	45.57 .95	94.5 1.8	41.34 .29	52.8 1.4
Oct. 6.3	36.42 .17	47.5 0.0	46.10 .17	33.8 0.4	44.58 1.02	96.1 1.4	41.04 .32	54.0 1.0
16.3	36.25 .18	47.4 −0.2	45.98 .17	34.2 0.4	43.54 1.06	97.2 0.8	40.71 .33	54.8 0.6
26.2	36.07 −.17	47.0 −0.4	45.76 −.17	34.6 −0.4	42.47 1.07	97.8 +0.3	40.37 −.33	55.2 −0.2
Nov. 5.2	35.91 .15	46.5 0.7	45.60 .15	35.0 0.5	41.40 1.05	97.8 −0.3	40.05 .31	55.2 +0.2
15.2	35.77 .13	45.6 0.9	45.45 .13	35.5 0.5	40.36 1.01	97.2 0.9	39.75 .27	54.8 0.6
25.2	35.65 .10	44.7 1.1	45.34 .10	36.0 0.5	39.38 .94	96.1 1.4	39.50 .23	54.0 1.0
Dec. 5.1	35.56 .07	43.5 1.3	45.25 .07	36.4 0.5	38.48 .84	94.4 1.9	39.30 .17	52.8 1.4
15.1	35.51 −.03	42.2 −1.4	45.20 −.03	36.9 −0.5	37.70 −.71	92.2 −2.4	39.16 −.11	51.2 +1.7
25.1	35.49 .00	40.7 1.5	45.18 .00	37.4 0.4	37.06 .56	89.5 2.8	39.09 −.04	49.4 2.0
35.1	35.52 +.04	39.1 −1.6	45.21 +.04	37.8 −0.4	36.58 −.39	86.5 −3.1	39.09 +.03	47.3 +2.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Cygni.		π Capricorni.		ε Delphini.		Groombridge 3241.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	20 18	+39 53	20 20	−18 34	20 27	+10 54	20 30	+72 8
	s	″	s	″	s	″	s	″
Jan. 0.1	6.91 −.04	43.4 −2.8	46.16 +.02	61.8 0.0	44.72 .00	66.8 −1.6	26.86 −.35	59.2 −3.0
10.0	6.89 .00	40.6 2.9	46.20 .06	61.8 0.0	44.74 +.03	65.1 1.7	26.58 .22	56.1 3.2
20.0	6.91 +.05	37.7 3.0	46.27 .09	61.8 +0.1	44.76 .06	63.4 1.7	26.42 −.09	52.8 3.4
30.0	6.98 .09	34.7 2.9	46.38 .13	61.7 0.2	44.86 .10	61.8 1.6	26.40 +.04	49.3 3.4
Feb. 9.0	7.10 .14	31.9 2.7	46.52 .16	61.4 0.3	44.98 .13	60.3 1.4	26.50 .17	45.9 3.3
18.9	7.26 +.18	29.3 −2.4	46.69 +.19	61.1 +0.4	45.12 +.16	59.0 −1.2	26.74 +.30	42.7 −3.1
28.9	7.47 .22	27.0 2.0	46.89 .21	60.6 0.5	45.30 .19	57.9 0.9	27.10 .42	39.7 2.8
Mar. 10.9	7.71 .26	25.2 1.6	47.12 .24	60.0 0.7	45.50 .21	57.2 0.6	27.57 .52	37.1 2.3
20.9	7.98 .29	23.9 1.1	47.37 .26	59.2 0.8	45.73 .24	56.8 −0.2	28.14 .61	35.0 1.8
30.8	8.28 .31	23.1 −0.5	47.64 .28	58.4 0.9	45.97 .26	56.8 +0.2	28.78 .67	33.4 1.2
Apr. 9.8	8.60 +.33	22.9 +0.1	47.92 +.29	57.4 +1.0	46.24 +.27	57.2 +0.6	29.48 +.72	32.5 −0.6
19.8	8.94 .34	23.2 0.7	48.22 .30	56.3 1.1	46.52 .29	57.9 0.9	30.22 .74	32.2 0.0
29.7	9.28 .34	24.1 1.2	48.52 .31	55.1 1.2	46.81 .29	59.0 1.3	30.96 .74	32.6 +0.7
May 9.7	9.62 .34	25.6 1.7	48.84 .31	53.9 1.2	47.10 .29	60.5 1.6	31.69 .71	33.6 1.3
19.7	9.95 .32	27.4 2.1	49.14 .30	52.7 1.2	47.40 .28	62.2 1.8	32.39 .67	35.1 1.8
29.7	19.26 +.30	29.8 +2.5	49.44 +.29	51.6 +1.1	47.67 +.27	64.0 +2.0	33.03 +.60	37.2 +2.3
June 8.6	10.55 .27	32.4 2.8	49.72 .27	50.6 1.0	47.94 .25	66.1 2.1	33 59 .52	39.7 2.7
18.6	10.80 .23	35.3 3.0	49.98 .24	49.6 0.9	48.18 .22	68.2 2.2	34.06 .42	42.6 3.1
28.6	11.01 .19	38.3 3.1	50.21 .21	48.9 0.7	48.39 .19	70.4 2.1	34.44 .32	45.8 3.3
July 8.6	11.17 .14	41.5 3.2	50.40 .17	48.3 0.5	48.56 .15	72.5 2.1	34.70 .20	49.2 3.5
18.5	11.28 +.09	44.6 +3.1	50.55 +.13	47.8 +0.3	48.70 +.11	74.6 +2.0	34.84 +.06	52.8 +3.6
28.5	11.34 +.03	47.7 3.0	50.65 .08	47.6 +0.2	48.79 .07	76.5 1.8	34.86 −.04	56.3 3.6
Aug. 7.5	11.35 −.02	50.7 2.9	50.71 +.03	47.5 0.0	48.83 +.02	78.2 1.7	34.76 .16	59.9 3.5
17.4	11.30 .07	53.4 2.6	50.72 −.01	47.6 −0.2	48.84 −.02	79.8 1.4	34.54 .28	63.3 3.3
27.4	11.20 .12	55.9 2.4	50.69 .06	47.9 0.3	48.79 .06	81.1 1.2	34.21 .38	66.5 3.1
Sept. 6.4	11.06 −.16	58.1 +2.0	50.61 −.10	48.2 −0.4	48.71 −.10	82.2 +1.0	33.78 −.48	69.4 +2.8
16.4	10.88 .20	60.0 1.7	50.49 .13	48.6 0.5	48.60 .13	83.1 0.7	33.26 .56	72.1 2.4
26.3	10.66 .23	61.5 1.3	50.35 .15	49.1 0.5	48.46 .15	83.6 0.5	32.65 .63	74.3 2.0
Oct. 6.3	10.43 .24	62.5 0.8	50.19 .17	49.6 0.5	48.30 .17	84.0 +0.2	31.99 .68	76.1 1.5
16.3	10.18 .25	63.1 +0.4	50.01 .17	50.1 0.5	48.12 .17	84.0 +0.1	31.29 .72	77.4 1.0
26.2	9.92 −.25	63.2 −0.1	49.84 −.17	50.6 −0.5	47.95 −.17	83.8 −0.3	30.56 −.73	78.2 +0.5
Nov. 5.2	9.68 .24	62.8 0.6	49.67 .16	51.0 0.4	47.78 .16	83.4 0.6	29.82 .73	78.4 −0.1
15.2	9.45 .22	62.0 1.1	49.52 .14	51.4 0.4	47.63 .14	82.7 0.8	29.10 .70	78.0 0.6
25.2	9.24 .19	60.7 1.5	49.40 .11	51.7 0.3	47.50 .12	81.7 1.1	28.42 .66	77.1 1.2
Dec. 5.1	9.07 .16	59.0 1.9	49.31 .08	52.0 0.3	47.39 .09	80.5 1.3	27.78 .59	75.6 1.8
15.1	8.93 −.12	56.8 −2.3	49.25 −.04	52.2 −0.2	47.31 −.06	79.1 −1.4	27.23 −.51	73.5 −2.3
25.1	8.83 .07	54.4 2.6	49.23 .00	52.4 0.1	47.27 −.03	77.6 1.6	26.76 .41	71.0 2.7
35.1	8.78 −.03	51.6 −2.8	49.24 +.03	52.5 −0.1	47.26 +.01	76.0 −1.7	26.41 −.29	68.1 −3.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Cygni.		μ Aquarii.		12 Year Cat. 1879.		ν Cygni.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	20h 37m	+44° 52′	20h 46m	− 9° 24′	20h 52m	+80° 7′	20h 52m	+40° 43′
	s	″	s	″	s	″	s	″
Jan. 0.1	31.40 −.08	36.7 −2.7	28.89 +.00	34.4 −0.6	39.90 −.79	44.3 −2.6	54.17 −.08	55.6 −2.6
10.1	31.34 −.04	33.8 2.9	28.90 .03	35.0 0.5	39.21 .58	41.5 3.0	54.11 −.04	52.9 2.7
20.0	31.33 +.01	30.8 3.0	28.94 .06	35.4 0.4	38.73 .36	38.4 3.2	54.09 .00	50.1 2.8
30.0	31.37 .07	27.8 3.0	29.02 .09	35.8 0.3	38.49 −.12	35.0 3.4	54.12 +.05	47.2 2.9
Feb. 9.0	31.46 .12	24.8 2.9	29.13 .12	36.1 −0.2	38.50 +.13	31.6 3.4	54.19 .10	44.4 2.7
19.0	31.60 +.16	22.0 −2.6	29.27 +.15	36.2 0.0	38.74 +.36	28.3 −3.2	54.31 +.14	41.8 −2.5
28.9	31.79 .21	19.5 2.3	29.43 .18	36.1 +0.2	39.22 .59	25.2 3.0	54.47 .19	39.4 2.2
Mar. 10.9	32.02 .25	17.4 1.9	29.62 .21	35.9 0.4	39.92 .79	22.4 2.6	54.68 .23	37.3 1.8
20.9	32.30 .29	15.8 1.3	29.84 .23	35.4 0.6	40.80 .97	20.0 2.1	54.92 .26	35.7 1.3
30.8	32.60 .32	14.8 0.8	30.09 .25	34.7 0.8	41.85 1.10	18.2 1.6	55.20 .29	34.7 0.8
Apr. 9.8	32.94 +.34	14.3 −0.2	30.35 +.27	33.8 +1.0	43.01 1.20	16.9 −1.0	55.51 +.32	34.2 −0.2
19.8	33.29 .36	14.4 +0.4	30.63 .29	32.7 1.2	44.25 1.25	16.2 −0.4	55.84 .34	34.2 +0.3
29.8	33.65 .36	15.0 1.0	30.92 .31	31.4 1.3	45.52 1.27	16.1 +0.2	56.18 .35	34.8 0.9
May 9.7	34.02 .36	16.3 1.5	31.22 .32	30.0 1.4	46.78 1.24	16.7 0.9	56.54 .35	35.9 1.4
19.7	34.38 .35	18.0 2.0	31.52 .30	28.6 1.5	47.99 1.17	17.8 1.4	56.88 .34	37.6 1.9
29.7	34.72 +.33	20.2 +2.4	31.82 +.29	27.1 +1.5	49.12 1.07	19.5 +2.0	57.22 +.32	39.7 +2.3
June 8.6	35.03 .30	22.8 2.7	32.10 .27	25.6 1.5	50.13 .94	21.7 2.4	57.53 .30	42.1 2.6
18.6	35.31 .26	25.6 3.0	32.36 .25	24.2 1.4	50.99 .77	24.4 2.8	57.81 .27	44.9 2.9
28.6	35.55 .21	28.7 3.2	32.60 .22	22.9 1.3	51.68 .59	27.3 3.1	58.06 .23	47.8 3.0
July 8.6	35.74 .16	32.0 3.3	32.80 .18	21.7 1.1	52.18 .40	30.6 3.3	58.26 .18	51.0 3.1
18.5	35.88 +.11	35.2 +3.3	32.96 +.14	20.6 +0.9	52.48 +.19	34.0 +3.5	58.42 +.13	54.1 +3.2
28.5	35.95 +.05	38.5 3.2	33.08 .10	19.8 0.8	52.57 −.02	37.6 3.5	58.52 .08	57.3 3.1
Aug. 7.5	35.98 −.01	41.7 3.1	33.16 .05	19.1 0.6	52.45 .22	41.1 3.5	58.57 +.02	60.4 3.0
17.5	35.94 .06	44.7 2.9	33.19 +.01	18.7 0.4	52.12 .42	44.6 3.5	58.56 −.03	63.3 2.8
27.4	35.85 .11	47.4 2.6	33.18 −.03	18.4 +0.2	51.60 .62	48.0 3.3	58.50 .08	66.1 2.6
Sept. 6.4	35.71 −.16	49.9 +2.3	33.12 −.07	18.3 0.0	50.89 −.79	51.2 +3.0	58.40 −.13	68.5 +2.3
16.4	35.53 .20	52.1 2.0	33.03 .11	18.3 −0.1	50.02 .95	54.1 2.8	58.24 .17	70.7 2.0
26.3	35.31 .23	53.9 1.6	32.91 .13	18.5 0.2	48.99 1.08	56.7 2.4	58.06 .20	72.5 1.6
Oct. 6.3	35.07 .26	55.2 1.1	32.77 .15	18.8 0.3	47.85 1.20	58.8 2.0	57.84 .22	73.8 1.2
16.3	34.80 .27	56.1 0.7	32.61 .16	19.2 0.4	46.60 1.28	60.6 1.5	57.61 .24	74.8 0.7
26.3	34.53 −.27	56.6 +0.2	32.44 −.16	19.6 −0.5	45.29 1.33	61.8 +1.0	57.37 −.24	75.3 +0.3
Nov. 5.2	34.26 .27	56.5 −0.3	32.29 .15	20.2 0.5	43.94 1.35	62.5 +0.4	57.12 .24	75.3 −0.2
15.2	34.00 .25	55.9 0.8	32.14 .14	20.7 0.6	42.59 1.34	62.6 −0.2	56.89 .23	74.9 0.7
25.2	33.76 .23	54.8 1.3	32.01 .12	21.3 0.6	41.27 1.28	62.1 0.8	56.67 .21	74.0 1.2
Dec. 5.2	33.55 .19	53.2 1.8	31.91 .09	21.9 0.6	40.02 1.19	61.1 1.3	56.47 .18	72.6 1.6
15.1	33.37 −.16	51.2 −2.2	31.83 −.06	22.5 −0.6	38.88 1.07	59.4 −1.9	56.30 −.15	70.7 −2.0
25.1	33.23 .11	48.8 2.5	31.79 −.03	23.1 0.6	37.89 .91	57.3 2.4	56.18 .11	68.5 2.4
35.1	33.14 −.06	46.1 −2.8	31.78 +.01	23.7 −0.6	37.07 −.72	54.7 −2.8	56.09 −.07	66.0 −2.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	61¹ Cygni.		ζ Cygni.		α Cephei.		1 Pegasi.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 21 1	° ′ +38 11	h m 21 8	° ′ +29 45	h m 21 15	° ′ +62 5	h m 21 16	° ′ +19 18
	s	″	s	″	s	″	s	″
Jan. 0.1	46.07 −.08	33.3 −2.3	3.94 −.07	45.5 −2.2	50.11 −.25	86.1 −2.5	47.76 −.06	70.2 −1.8
10.1	46.02 −.04	30.9 2.5	3.89 −.03	43.2 2.3	49.89 .18	83.4 2.9	47.72 −.02	68.4 1.9
20.0	46.00 +.01	28.3 2.6	3.88 .00	40.8 2.4	49.74 .11	80.3 3.1	47.72 +.01	66.5 1.9
30.0	46.03 .05	25.6 2.7	3.90 +.04	38.4 2.4	49.67 −.03	77.1 3.3	47.74 .04	64.6 1.9
Feb. 9.0	46.10 .10	23.0 2.6	3.96 .08	36.0 2.3	49.68 +.05	73.8 3.3	47.80 .08	62.7 1.8
19.0	46.22 +.14	20.5 −2.4	4.06 +.12	33.8 −2.1	49.77 +.13	70.6 −3.1	47.90 +.12	61.0 −1.6
28.9	46.38 .18	18.3 2.1	4.20 .16	31.8 1.8	49.95 .21	67.6 2.9	48.04 .15	59.5 1.3
Mar. 10.9	46.58 .22	16.4 1.7	4.38 .19	30.2 1.4	50.20 .29	64.8 2.5	48.19 .17	58.4 1.0
20.9	46.82 .26	14.9 1.2	4.59 .23	28.9 1.0	50.52 .36	62.5 2.1	48.38 .21	57.5 0.6
30.9	47.10 .29	14.0 0.7	4.83 .26	28.1 0.6	50.91 .41	60.7 1.5	48.60 .24	57.1 −0.2
Apr. 9.8	47.40 +.32	13.5 −0.2	5.10 +.28	27.8 −0.1	51.35 +.46	59.4 −1.0	48.85 +.26	57.1 +0.2
19.8	47.73 .34	13.6 +0.4	5.39 .30	28.0 +0.4	51.83 .49	58.8 −0.3	49.12 .28	57.6 0.6
29.8	48.07 .35	14.3 0.9	5.70 .31	28.7 0.9	52.33 .51	58.7 +0.3	49.41 .30	58.4 1.1
May 9.7	48.42 .35	15.5 1.4	6.02 .32	29.9 1.4	52.85 .51	59.3 0.9	49.71 .30	59.7 1.4
19.7	48.77 .35	17.2 1.9	6.34 .32	31.5 1.8	53.36 .50	60.5 1.5	50.02 .30	61.3 1.8
29.7	49.11 +.33	19.3 +2.3	6.65 +.30	33.4 +2.1	53.86 +.48	62.2 +2.0	50.32 +.30	63.2 +2.0
June 8.7	49.44 .31	21.7 2.6	6.95 .29	35.7 2.4	54.32 .44	64.4 2.4	50.61 .28	65.3 2.2
18.6	49.73 .28	24.5 2.9	7.23 .26	38.3 2.6	54.74 .39	67.1 2.8	50.88 .26	67.6 2.4
28.6	49.99 .24	27.5 3.1	7.47 .23	41.0 2.8	55.10 .33	70.1 3.1	51.13 .23	70.1 2.5
July 8.6	50.21 .20	30.6 3.2	7.68 .19	43.8 2.8	55.39 .26	73.3 3.4	51.34 .20	72.6 2.5
18.6	50.38 +.15	33.8 +3.2	7.85 +.15	46.7 +2.8	55.62 +.18	76.8 +3.5	51.52 +.16	75.0 +2.4
28.5	50.51 .10	37.0 3.2	7.98 .10	49.5 2.8	55.76 .10	80.3 3.6	51.66 .11	77.4 2.3
Aug. 7.5	50.58 +.04	40.2 3.0	8.05 +.05	52.2 2.7	55.82 +.02	83.9 3.6	51.75 .07	79.7 2.2
17.5	50.60 −.01	43.1 2.9	8.08 .00	54.8 2.5	55.80 −.06	87.4 3.5	51.79 +.02	81.8 2.0
27.4	50.56 .06	45.9 2.6	8.06 −.04	57.1 2.2	55.70 .14	90.8 3.3	51.79 −.02	83.8 1.8
Sept. 6.4	50.48 −.10	48.4 +2.4	7.99 −.09	59.2 +2.0	55.53 −.21	94.0 +3.0	51.75 −.06	85.4 +1.5
16.4	50.36 .14	50.6 2.0	7.89 .12	61.1 1.7	55.29 .27	96.9 2.7	51.66 .10	86.8 1.3
26.4	50.20 .17	52.5 1.7	7.75 .15	62.6 1.3	54.99 .33	99.5 2.4	51.55 .13	87.9 1.0
Oct. 6.3	50.02 .20	53.9 1.3	7.58 .18	63.7 1.0	54.64 .37	101.7 2.0	51.41 .15	88.8 0.7
16.3	49.81 .21	55.0 0.9	7.40 .19	64.5 0.6	54.25 .40	103.4 1.5	51.25 .16	89.3 +0.4
26.3	49.59 −.22	55.6 +0.4	7.20 −.20	64.9 +0.2	53.83 −.42	104.6 +1.0	51.08 −.17	89.4 0.0
Nov. 5.3	49.37 .22	55.8 −0.1	7.00 .20	64.9 −0.2	53.40 .43	105.3 +0.4	50.91 .17	89.3 −0.3
15.2	49.16 .21	55.5 0.5	6.80 .19	64.5 0.6	52.97 .43	105.5 −0.1	50.74 .16	88.9 0.6
25.2	48.96 .19	54.8 1.0	6.63 .17	63.7 1.0	52.54 .41	105.1 0.7	50.59 .15	88.1 0.9
Dec. 5.2	48.78 .16	53.5 1.4	6.47 .15	62.4 1.4	52.14 .38	104.1 1.3	50.45 .13	87.0 1.2
15.1	48.63 −.13	51.9 −1.8	6.33 −.12	60.9 −1.7	51.78 −.34	102.5 −1.8	50.34 −.10	85.7 −1.5
25.1	48.51 .10	49.9 2.1	6.23 .09	59.0 2.0	51.46 .29	100.4 2.3	50.25 .07	84.2 1.7
35.1	48.43 −.07	47.6 −2.4	6.16 −.06	56.9 −2.2	51.20 −.23	97.9 −2.7	50.19 −.04	82.4 −1.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Aquarii.		β Cephei.		ξ Aquarii.		ε Pegasi.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 21 25	° ′ − 6 3	h m 21 27	° ′ +70 3	h m 21 31	° ′ − 8 21	h m 21 38	° ′ + 9 21
	s	″	s	″	s	″	s	″
Jan. 0.1	32.22 −.04	77.7 −0.7	9.53 −.41	54.6 −2.4	39.76 −.03	52.4 −0.6	34.20 −.06	15.5 −1.3
10.1	32.19 −.01	78.4 0.6	9.17 .32	52.0 2.8	39.73 −.01	53.0 0.5	34.16 −.03	14.2 1.4
20.1	32.20 +.02	79.0 0.6	8.90 .22	49.0 3.1	39.73 +.02	53.4 0.4	34.14 .00	12.8 1.4
30.0	32.24 .05	79.5 0.4	8.73 −.11	45.8 3.3	39.76 .05	53.8 0.3	34.15 +.03	11.4 1.3
Feb. 9.0	32.30 .08	79.9 0.3	8.68 +.01	42.5 3.3	39.82 .08	54.0 −0.1	34.20 .06	10.2 1.2
19.0	32.40 +.11	80.1 −0.1	8.74 +.12	39.2 −3.3	39.92 +.11	54.1 0.0	34.27 +.09	9.1 −1.0
28.9	32.52 .14	80.1 +0.1	8.92 .24	36.0 3.1	40.04 .14	53.9 +0.2	34.38 .12	8.2 0.8
Mar. 10.9	32.68 .17	79.9 0.3	9.22 .34	33.0 2.7	40.19 .17	53.6 0.4	34.52 .16	7.5 0.5
20.9	32.86 .20	79.5 0.5	9.61 .44	30.5 2.3	40.37 .20	53.1 0.7	34.69 .19	7.1 −0.2
30.9	33.08 .23	78.8 0.8	10.10 .53	28.4 1.8	40.58 .22	52.3 0.9	34.89 .22	7.1 +0.2
Apr. 9.8	33.32 +.25	77.9 +1.0	10.66 +.59	26.9 −1.2	40.82 +.26	51.3 +1.1	35.12 +.24	7.4 +0.5
19.8	33.58 .27	76.8 1.2	11.29 .64	25.9 −0.6	41.08 .27	50.1 1.3	35.38 .27	8.1 0.8
29.8	33.86 .29	75.5 1.4	11.95 .67	25.6 0.0	41.36 .29	48.7 1.5	35.65 .28	9.1 1.2
May 9.8	34.15 .30	74.0 1.5	12.62 .68	25.9 +0.6	41.65 .30	47.2 1.6	35.94 .29	10.4 1.5
19.7	34.45 .30	72.4 1.6	13.30 .66	26.8 1.2	41.95 .30	45.6 1.6	36.24 .30	12.0 1.7
29.7	34.75 +.30	70.7 +1.7	13.95 +.63	28.3 +1.7	42.26 +.30	43.9 +1.7	36.54 +.30	13.8 +1.9
June 8.7	35.04 .29	69.0 1.7	14.56 .58	30.3 2.2	42.55 .29	42.2 1.7	36.83 .29	15.8 2.0
18.6	35.32 .27	67.3 1.6	15.12 .51	32.8 2.7	42.84 .27	40.6 1.6	37.11 .27	17.9 2.1
28.6	35.58 .24	65.7 1.5	15.59 .43	35.6 3.0	43.10 .25	39.1 1.5	37.37 .25	20.0 2.1
July 8.6	35,81 .21	64.3 1.4	15.98 .34	38.8 3.3	43.34 .22	37.7 1.4	37.60 .21	22.2 2.1
18.6	36.00 +.17	62.9 +1.2	16.28 +.24	42.2 +3.5	43.54 +.18	36.5 +1.2	37.80 +.18	24.3 +2.0
28.5	36.16 .13	61.8 1.0	16.47 .14	45.8 3.6	43.70 .14	35.4 0.9	37.96 .14	26.2 1.9
Aug. 7.5	36.27 .09	60.8 0.8	16.55 +.03	49.4 3.6	43.82 .10	34.6 0.7	38.07 .09	28.0 1.7
17.5	36.34 +.04	60.1 0.6	16.53 −.08	53.0 3.6	43.89 .05	34.0 0.5	38.14 .05	29.7 1.5
27.5	36.36 .00	59.6 0.4	16.40 .18	56.5 3.5	43.92 +.01	33.6 0.3	38.17 +.01	31.1 1.3
Sept. 6.4	36.34 −.04	59.3 +0.2	16.17 −.28	59.9 +3.3	43.91 −.03	33.4 +0.1	38.16 −.03	32.3 +1.1
16.4	36.28 .08	59.2 0.0	15.85 .36	63.0 3.0	43.86 .07	33.4 −0.1	38.10 .07	33.3 0.8
26.4	36.19 .11	59.2 −0.1	15.44 .44	65.9 2.7	43.77 .10	33.6 0.2	38.02 .10	34.0 0.6
Oct. 6.3	36.07 .13	59.4 0.3	14.96 .51	68.4 2.3	43.65 .13	33.9 0.4	37.90 .13	34.5 0.4
16.3	35.93 .14	59.7 0.4	14.43 .56	70.4 1.8	43.52 .14	34.3 0.5	37.77 .14	34.7 +0.1
26.3	35.78 −.15	60.2 −0.5	13.85 −.60	71.9 +1.3	43.37 −.15	34.8 −0.5	37.62 −.15	34.7 −0.1
Nov. 5.3	35.63 .15	60.7 0.6	13.24 .62	73.0 0.7	43.22 .15	35.4 0.6	37.47 .15	34.5 0.4
15.2	35.48 .14	61.3 0.6	12.62 .62	73.4 +0.2	43.07 .14	36.0 0.6	37.32 .15	34.0 0.6
25.2	35.35 .13	61.9 0.7	12.00 .61	73.3 −0.4	42.94 .13	36.6 0.6	37.18 .14	33.3 0.8
Dec. 5.2	35.23 .11	62.6 0.7	11.40 .57	72.6 1.0	42.82 .11	37.2 0.6	37.05 .12	32.5 1.0
15.2	35.14 −.08	63.3 −0.7	10.85 −.52	71.2 −1.6	42.72 −.09	37.9 −0.6	36.94 −.10	31.4 −1.1
25.1	35.07 .06	64.0 0.7	10.36 .46	69.4 2.1	42.65 .06	38.5 0.6	36.85 .07	30.2 1.2
35.1	35.02 −.03	64.7 −0.7	9.93 −.38	67.0 −2.6	42.60 −.03	39.1 −0.5	36.79 −.05	28.9 −1.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	11 Cephei.		μ Capricorni.		79 Draconis.		α Aquarii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 21 40	° ′ +70 47	h m 21 47	° ′ −14 4	h m 21 51	° ′ +73 9	h m 21 59	° ′ − 0 52
	s	″	s	″	s	″	s	″
Jan. 0.1	13.61 −.45	29.9 −2.2	3.57 −.05	77.3 −0.3	25.37 −.55	65.5 −2.1	54.68 −.07	21.7 −0.9
10.1	13.20 .36	27.4 2.7	3.53 −.03	77.5 0.2	24.86 .45	63.1 2.5	54.63 .04	22.6 0.8
20.1	12.88 .26	24.5 3.0	3.52 .00	77.7 −0.1	24.46 .34	60.4 2.9	54.60 −.01	23.4 0.8
30.0	12.67 .15	21.4 3.2	3.54 +.03	77.7 +0.1	24.18 .22	57.3 3.2	54.60 +.01	24.1 0.7
Feb. 9.0	12.58 −.03	18.1 3.3	3.58 .06	77.5 0.2	24.02 −.09	54.0 3.3	54.63 .04	24.8 0.6
19.0	12.61 +.09	14.8 −3.3	3.66 +.09	77.2 +0.4	24.01 +.05	50.7 −3.3	54.69 +.07	25.2 −0.4
Mar. 1.0	12.76 .21	11.6 3.1	3.77 .13	76.7 0.6	24.13 .19	47.5 3.2	54.78 .10	25.5 −0.2
10.9	13.02 .32	8.6 2.8	3.91 .16	76.0 0.8	24.39 .33	44.4 2.9	54.90 .14	25.6 +0.1
20.9	13.40 .43	5.9 2.4	4.08 .19	75.1 1.0	24.78 .45	41.6 2.6	55.05 .17	25.4 0.3
30.9	13.88 .52	3.7 2.0	4.29 .22	74.0 1.2	25.29 .56	39.3 2.1	55.24 .20	24.9 0.6
Apr. 9.9	14.44 +.59	2.0 −1.4	4.52 +.24	72.8 +1.3	25.90 +.65	37.4 −1.6	55.45 +.23	24.2 +0.9
19.8	15.07 .65	0.9 0.8	4.77 .27	71.4 1.5	26.58 .72	36.2 1.0	55.69 .25	23.2 1.1
29.8	15.74 .69	0.4 −0.2	5.05 .29	69.8 1.6	27.33 .76	35.5 −0.4	55.96 .27	21.9 1.4
May 9.8	16.44 .70	0.5 +0.4	5.35 .30	68.2 1.6	28.11 .79	35.4 +0.2	56.24 .29	20.4 1.6
19.7	17.14 .69	1.2 1.0	5.65 .31	66.5 1.7	28.90 .78	35.9 0.8	56.54 .30	18.8 1.7
29.7	17.83 +.67	2.6 +1.6	5.96 +.31	64.9 +1.6	29.67 +.75	37.1 +1.4	56.84 +.30	17.0 +1.8
June 8.7	18.47 .62	4.4 2.1	6.27 .30	63.3 1.6	30.40 .71	38.8 1.9	57.14 .30	15.1 1.9
18.7	19.06 .56	6.8 2.5	6.57 .29	61.8 1.4	31.08 .64	40.9 2.4	57.43 .28	13.2 1.9
28.6	19.58 .48	9.5 2.9	6.85 .27	60.4 1.3	31.69 .55	43.6 2.8	57.70 .26	11.4 1.8
July 8.6	20.02 .39	12.6 3.2	7.10 .24	59.2 1.1	32.19 .46	46.6 3.1	57.95 .23	9.6 1.7
18.6	20.35 +.28	15.9 +3.4	7.32 +.20	58.2 +0.9	32.60 +.34	49.8 +3.4	58.17 +.20	8.0 +1.6
28.6	20.59 .18	19.4 3.6	7.50 .16	57.4 0.7	32.88 .23	53.3 3.6	58.35 .16	6.5 1.4
Aug. 7.5	20.71 +.07	23.1 3.7	7.64 .12	56.9 0.4	33.05 +.11	56.9 3.6	58.49 .12	5.2 1.2
17.5	20.72 −.04	26.8 3.6	7.73 .07	56.6 +0.2	33.09 −.02	60.6 3.7	58.58 .08	4.1 1.0
27.5	20.63 .15	30.4 3.6	7.78 +.02	56.5 0.0	33.02 .14	64.2 3.6	58.64 +.03	3.2 0.8
Sept. 6.4	20.43 −.25	33.8 +3.4	7.78 −.02	56.6 −0.2	32.82 −.25	67.8 +3.5	58.65 −.01	2.5 +0.6
16.4	20.13 .34	37.1 3.1	7.74 .06	56.9 0.4	32.51 .36	71.1 3.2	58.62 .05	2.1 0.3
26.4	19.75 .43	40.0 2.8	7.66 .09	57.4 0.5	32.10 .46	74.2 2.9	58.55 .08	1.9 +0.1
Oct. 6.4	19.28 .50	42.7 2.4	7.56 .12	58.0 0.6	31.60 .54	77.0 2.6	58.46 .11	1.8 −0.1
16.3	18.75 .56	44.9 2.0	7.43 .14	58.6 0.7	31.02 .61	79.4 2.2	58.34 .12	2.0 0.2
26.3	18.17 −.60	46.6 +1.5	7.29 −.15	59.3 −0.7	30.37 −.67	81.3 +1.7	58.21 −.14	2.3 −0.4
Nov. 5.3	17.55 .63	47.8 0.9	7.14 .15	60.0 0.7	29.68 .71	82.8 1.2	58.07 .14	2.7 0.5
15.3	16.92 .64	48.5 +0.4	6.99 .14	60.6 0.7	28.95 .73	83.6 +0.6	57.93 .14	3.2 0.6
25.2	16.28 .63	48.6 −0.2	6.85 .13	61.3 0.6	28.22 .73	83.9 0.0	57.79 .13	3.9 0.7
Dec. 5.2	15.66 .60	48.1 0.8	6.73 .12	61.8 0.5	27.50 .71	83.6 −0.6	57.67 .12	4.6 0.8
15.2	15.07 −.56	47.0 −1.4	6.62 −.09	62.3 −0.5	26.81 −.66	82.7 −1.2	57.56 −.10	5.4 −0.8
25.1	14.54 .50	45.3 1.9	6.54 .07	62.8 0.4	26.18 .60	81.2 1.8	57.47 .08	6.3 0.9
35.1	14.07 −.42	43.1 −2.4	6.48 −.04	63.1 −0.2	25.61 −.52	79.2 −2.3	57.40 −.05	7.1 −0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Gruis.		θ Aquarii.		π Aquarii.		η Aquarii.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 22 1	° ′ -47 30	h m 22 10	° ′ - 8 20	h m 22 19	° ′ + 0 47	h m 22 29	° ′ - 0 41
	s	″	s	″	s	″	s	″
Jan. 0.1	0.58 -.12	53.4 +1.2	48.00 -.07	62.4 -0.6	26.40 -.08	59.1 -0.9	29.01 -.08	76.2 -0.9
10.1	0.48 .08	52.0 1.5	47.94 .05	63.0 0.5	26.33 .06	58.2 0 9	28.94 .06	77.0 0.8
20.1	0.43 -.03	50.4 1.8	47.91 -.02	63.4 0.4	26.29 -.03	57.4 0.8	28.88 .04	77.8 0.7
30.0	0.42 +.01	48.5 2.0	47.90 +.01	63.7 0.2	26.27 .00	56.6 0.7	28.86 -.01	78.5 0.7
Feb. 9.0	0.46 .06	46.3 2.2	47.93 .04	63.9 -0.1	26.28 +.02	55.9 0.6	28.86 +.02	79.1 0.5
19.0	0.54 +.10	44.0 +2.4	47.98 +.07	63.9 +0.1	26.31 +.05	55.4 -0.5	28.89 +.04	79.6 -0.4
Mar. 1.0	0.67 .15	41.6 2.5	48.06 .10	63.7 0.3	26.38 .08	55.0 -0.3	28.94 .08	79.8 -0.1
10.9	0.84 .19	39.1 2.5	48.17 .13	63.3 0.5	26.48 .12	54.8 0.0	29.04 .11	79.8 +0.1
20.9	1.05 .24	36.6 2.5	48.32 .16	62.6 0.7	26.62 .15	55.0 +0.3	29.16 .14	79.6 0.4
30.9	1.31 .28	34.1 2.5	48.49 .19	61.8 1.0	26.78 .18	55.4 0.5	29.32 .18	79.1 0.6
Apr. 9.9	1.61 +.32	31.7 +2.3	48.70 +.22	60.7 +1.2	26.98 +.21	56.0 +0.8	29.51 +.21	78.4 +0.9
19.8	1.94 .35	29.4 2.2	48.94 .25	59.4 1.4	27.21 .24	57.0 1.1	29.74 .24	77.4 1.1
29.8	2.31 .38	27.3 2.0	49.20 .27	57.9 1.5	27.47 .27	58.2 1.3	29.98 .26	76.1 1.4
May 9.8	2.70 .40	25.4 1.7	49.48 .29	56.3 1.7	27.74 .28	59.7 1.5	30.26 .28	74.6 1.6
19.7	3.11 .41	23.8 1.5	49.78 .30	54.6 1.8	28.04 .30	61.3 1.7	30.55 .30	73.0 1.7
29.7	3.53 +.42	22.5 +1.1	50.09 +.31	52.8 +1.8	28.34 +.30	63.1 +1.9	30.85 +.30	71.2 +1.9
June 8.7	3.95 .41	21.5 0.8	50.39 .30	51.0 1.8	28.64 .30	65.0 1.9	31.15 .30	69.3 1.9
18.7	4.35 .39	20.9 +0.4	50.69 .29	49.3 1.7	28.94 .29	66.9 1.9	31.45 .29	67.3 1.9
28.6	4.73 .37	20.7 0.0	50.98 .27	47.6 1.6	29.22 .27	68.9 1.9	31.74 .27	65.4 1.9
July 8.6	5.08 .33	20.9 -0.4	51.24 .24	46.1 1.4	29.48 .24	70.8 1.8	32.00 .25	63.6 1.8
18.6	5.39 +.28	21.5 -0.8	51.46 +.21	44.8 +1.2	29.71 +.21	72.5 +1.7	32.24 +.22	61.9 +1.6
28.6	5.65 .23	22.4 1.1	51.66 .18	43.6 1.0	29.90 .18	74.1 1.5	32.44 .18	60:3 1.5
Aug. 7.5	5.86 .17	23.7 1.4	51.82 .13	42.7 0.8	30.06 .14	75.6 1.3	32.61 .14	59.0 1.3
17.5	6.00 .11	25.3 1.7	51.93 .09	42.0 0.6	30.17 .09	76.8 1.1	32.74 .10	57.8 1.0
27.5	6.08 +.05	27.0 1.8	51.99 +.05	41.6 0.3	30.25 .05	77.8 0.9	32.82 .06	56.9 0.8
Sept. 6.4	6.09 -.02	28.9 -2.0	52.02 .00	41.3 +0.1	30.27 +.01	78.6 +0.7	32.86 +.02	56.2 +0.6
16.4	6.04 .08	30.9 2.0	52.00 -.04	41.3 -0.1	30.26 -.03	79.1 0.4	32.86 -.02	55.7 0.4
26.4	5.94 .13	32.9 1.9	51.94 .07	41.5 0.2	30.22 .06	79.4 +0.2	32.82 .06	55.4 +0.2
Oct. 6.4	5.79 .17	34.8 1.8	51.86 .10	41.8 0.4	30.14 .09	79.6 0.0	32.75 .08	55.4 0.0
16.3	5.60 .20	36.5 1.6	51.75 .12	42.3 0.5	30.04 .11	79.5 -0.2	32.65 .11	55.5 -0.2
26.3	5.38 -.23	38.0 -1.3	51.62 -.13	42.8 -0.6	29.92 -.13	79.3 -0.3	32.54 -.12	55.8 -0.4
Nov. 5.3	5.15 .24	39.2 1.0	51.48 .14	43.4 0.6	29.78 .13	78.9 0.5	32.42 .13	56.2 0.5
15.3	4.91 .23	40.0 0.6	51.35 .14	44.1 0.7	29.65 .13	78.4 0.6	32.28 .13	56.8 0.6
25.2	4.68 .22	40.4 -0.2	51.21 .13	44.8 0.7	29.51 .13	77.8 0.7	32.15 .13	57.4 0.7
Dec. 5.2	4.46 .20	40.4 +0.2	51.08 .12	45.5 0.7	29.39 .12	77.0 0.8	32.02 .12	58.1 0.7
15.2	4.27 -.17	40.1 +0.6	50.97 -.10	46.2 -0.7	29 27 -.11	76.2 -0.8	31.91 -.11	58.9 -0.8
25.1	4.12 .14	39.3 1.0	50.88 .08	46.8 0.6	29.17 .09	75.4 0.9	31.81 .09	59.7 0.8
35.1	4.00 -.10	38.2 +1.3	50.81 -.06	47.3 -0.5	29.09 -.07	74.5 -0.9	31.72 -.08	60.5 -0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	226 Cephei (B.)		ζ Pegasi.		ι Cephei.		λ Aquarii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 22 30	° ′ +75 38	h m 22 35	° ′ +10 14	h m 22 45	° ′ +65 35	h m 22 46	° ′ − 8 10
	s	″	s	″	s	″	s	″
Jan. 0.2	15.59 −.73	39.4 −1.6	45.86 −.09	15.6 −1.2	37.00 −.40	81.0 −1.5	39.15 −.09	71.3 −0.6
10.1	14.90 .64	37.5 2.1	45.77 .07	14.4 1.2	36.61 .36	79.3 2.0	39.06 .07	71.9 0.5
20.1	14.31 .53	35.2 2.5	45.71 .05	13.2 1.2	36.28 .30	77.0 2.4	39.00 .05	72.3 0.4
30.1	13.84 .40	32.5 2.9	45.67 −.03	12.0 1.2	36.00 .23	74.4 2.8	38.96 −.03	72.6 −0.2
Feb. 9.1	13.51 .25	29.4 3.1	45.66 .00	10.8 1.1	35.81 .15	71.5 3.0	38.95 .00	72.7 0.0
19.0	13.33 −.10	26.2 −3.3	45.68 +.03	9.7 −1.0	35.70 −.07	68.4 −3.1	38.96 +.03	72.7 +0.1
Mar. 1.0	13.32 +.07	22.9 3.2	45.72 .07	8.8 0.8	35.68 +.03	65.2 3.1	39.01 .06	72.4 0.3
11.0	13.47 .23	19.7 3.1	45.81 .10	8.1 0.6	35.76 .13	62.2 3.0	39.08 .09	72.0 0.6
20.9	13.78 .39	16.7 2.8	45.92 .14	7.7 −0.3	35.93 .22	59.3 2.7	39.19 .13	71.3 0.8
30.9	14.24 .53	14.1 2.5	46.08 .17	7.6 0.0	36.19 .31	56.7 2.4	39.34 .16	70.4 1.0
Apr. 9.9	14.84 +.65	11.8 −2.0	46.27 +.20	7.8 +0.4	36.55 +.39	54.6 −1.9	39.52 +.20	69.3 +1.2
19.9	15.55 .76	10.0 1.5	46.49 .23	8.3 0.7	36.97 .46	52.9 1.4	39.73 .23	67.9 1.4
29.8	16.35 .83	8.8 0.9	46.74 .26	9.2 1.0	37.46 .52	51.8 0.8	39.97 .26	66.4 1.6
May 9.8	17.22 .89	8.2 −0.3	47.01 .28	10.4 1.3	38.00 .56	51.2 −0.3	40.24 .28	64.7 1.7
19.8	18.12 .91	8.2 +0.3	47.30 .30	11.9 1.6	38.57 .58	51.2 +0.3	40.52 .29	62.9 1.8
29.8	19.04 +.90	8.8 +0.9	47.60 +.30	13.6 +1.8	39.16 +.58	51.9 +0.9	40.83 +.30	61.0 +1.9
June 8.7	19.93 .87	10.0 1.4	47.91 .30	15.5 2.0	39.74 .57	53.0 1.5	41.13 .31	59.1 1.9
18.7	20.78 .81	14.7 2.0	48.21 .29	17.6 2.1	40.30 .55	54.8 2.0	41.44 .30	57.3 1.8
28.7	21.56 .74	13.9 2.4	48.50 .28	19.7 2.2	40.83 .50	57.0 2.4	41.74 .29	55.5 1.7
July 8.6	22.25 .64	16.5 2.8	48.76 .25	21.9 2.2	41.31 .45	59.6 2.8	42.01 .27	53.9 1.6
18.6	22.83 +.52	19.5 +3.2	49.00 +.22	24.0 +2.1	41.73 +.38	62.5 +3.1	42.27 +.24	52.4 +1.4
28.6	23.30 .40	22.8 3.4	49.21 .19	26.0 2.0	42.08 .31	65.8 3.3	42.49 .20	51.2 1.1
Aug. 7.6	23.63 .27	26.3 3.6	49.38 .15	28.0 1.8	42.35 .23	69.2 3.5	42.67 .16	50.1 0.9
17.5	23.83 +.13	30.0 3.7	49.50 .11	29.7 1.7	42.54 .14	72.8 3.6	42.82 .12	49.4 0.6
27.5	23.89 −.01	33.7 3.7	49.59 .06	31.3 1.5	42.64 +.06	76.4 3.6	42.92 .08	48.8 0.4
Sept. 6.5	23.82 −.14	37.3 +3.6	49.63 +.02	32.6 +1.2	42.66 −.02	80.0 +3.5	42.98 +.04	48.6 +0.2
16.5	23.61 .27	40.9 3.5	49.63 −.02	33.8 1.0	42.59 .10	83.4 3.4	43.00 .00	48.5 0.0
26.4	23.27 .40	44.3 3.3	49.60 .05	34.7 0.8	42.45 .18	86.8 3.2	42.97 −.04	48.7 −0.3
Oct. 6.4	22.81 .56	47.5 3.0	49.53 .08	35.3 0.5	42.24 .25	89.8 2.9	42.92 .07	49.0 0.4
16.4	22.26 .61	50.4 2.7	49.44 .10	35.7 0.3	41.95 .31	92.6 2.6	42.84 .09	49.5 0.5
26.3	21.60 −.69	52.8 +2.2	49.33 −.12	35.9 +0.1	41.62 −.36	94.9 +2.1	42.73 −.11	50.1 −0.6
Nov. 5.3	20.87 .76	54.8 1.7	49.20 .13	35.8 −0.2	41.23 .40	96.9 1.7	42.61 .12	50.8 0.7
15.3	20.08 .81	56.3 1.2	49.06 .13	35.5 0.4	40.81 .43	98.3 1.2	42.48 .13	51.5 0.7
25.3	19.25 .84	57.2 +0.6	48.93 .13	35.0 0.6	40.36 .45	99.2 +0.6	42.36 .13	52.3 0.7
Dec 5.2	18.40 .84	57.5 0.0	48.80 .13	34.4 0.8	39.90 .46	99.5 0.0	42.23 .12	53.0 0.7
15.2	17.57 −.82	57.2 −0.6	48.68 −.12	33.5 −0.9	39.44 −.45	99.2 −0.6	42.11 −.11	53.7 −0.7
25.2	16.77 .77	56.3 1.2	48.56 .10	32.5 1.1	39.00 .43	98.3 1.2	42.00 .10	54.3 0.6
35.2	16.02 −.71	54.8 −1.8	48.47 −.08	31.4 −1.2	38.58 −.39	96.9 −1.7	41.91 −.08	54.9 −0.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α Piscis Australis. (Fomalhaut.)*		*α Pegasi. (Markab.)*		*o Cephei.*		*θ Piscium.*	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 22 51	° ′ −30 13	h m 22 59	° ′ +14 35	h m 23 13	° ′ +67 29	h m 23 22	° ′ + 5 45
	s	″	s	″	s	″	s	″
Jan. 0.2	19.74 −.11	42.8 +0.2	4.38 −.11	36.0 −1.1	57.02 −.47	34.5 −1.1	10.58 −.11	11.0 −0.9
10.2	19.64 .09	42.5 0.5	4.28 .09	34.8 1.2	56.56 .43	33.1 1.6	10.48 .10	10.1 0.9
20.1	19.56 .06	41.9 0.7	4.19 .07	33.5 1.3	56.15 .38	31.2 2.1	10.38 .08	9.2 0.9
30.1	19.51 .04	41.0 1.0	4.13 .05	32.2 1.3	55.80 .31	28.8 2.5	10.31 .06	8.3 0.9
Feb. 9.1	19.49 −.01	39.9 1.2	4.09 −.02	30.8 1.3	55.53 .23	26.1 2.8	10.26 .04	7.4 0.8
19.0	19.50 +.03	38.6 +1.5	4.08 +.01	29.6 −1.2	55.34 −.14	23.2 −3.0	10.24 −.01	6.7 −0.7
Mar. 1.0	19.55 .06	37.0 1.7	4.11 .04	28.4 1.0	55.24 −.04	20.1 3.1	10.24 +.02	6.1 0.5
11.0	19.63 .10	35.2 1.9	4.17 .08	27.5 0.8	55.25 +.06	17.0 3.0	10.28 .05	5.7 −0.3
20.9	19.74 .14	33.3 2.0	4.26 .11	26.8 0.5	55.37 .17	14.0 2.9	10.35 .09	5.6 0.0
30.9	19.90 .18	31.2 2.1	4.39 .15	26.5 −0.2	55.59 .27	11.3 2.6	10.46 .13	5.7 +0.3
Apr. 9.9	20.10 +.21	29.1 +2.2	4.56 +.19	26.4 +0.1	55.91 +.36	8.9 −2.2	10.60 +.16	6.1 +0.6
19.9	20.32 .25	26.9 2.2	4.77 .22	26.7 0.5	56.32 .45	6.9 1.7	10.78 .20	6.8 0.8
29.8	20.59 .28	24.7 2.2	5.01 .25	27.4 0.8	56.80 .52	5.5 1.2	11.00 .23	7.8 1.1
May 9.8	20.88 .31	22.5 2.1	5.27 .28	28.4 1.2	57.35 .57	4.5 −0.6	11.25 .26	9.0 1.4
19.8	21.20 .33	20.4 2.0	5.56 .30	29.7 1.5	57.94 .61	4.2 0.0	11.52 .28	10.5 1.6
29.8	21.53 +.34	18.5 +1.8	5.86 +.31	31.3 +1.7	58.56 +.63	4.4 +0.5	11.81 +.30	12.2 +1.8
June 8.7	21.88 .34	16.7 1.6	6.18 .31	33.1 1.9	59.19 .63	5.2 1.1	12.12 .30	14.1 1.9
18.7	22.22 .34	15.2 1.4	6.48 .30	35.1 2.1	59.82 .61	6.6 1.6	12.42 .30	16.1 2.0
28.7	22.55 .33	14.0 1.1	6.78 .29	37.3 2.2	60.41 .57	8.4 2.1	12.72 .29	18.1 2.0
July 8.7	22.87 .30	13.1 0.7	7.06 .27	39.5 2.2	60.96 .53	10.8 2.5	13.01 .26	20.2 2.0
18.6	23.16 +.28	12.5 +0.4	7.32 +.24	41.8 +2.2	61.46 +.46	13.5 +2.9	13.28 +.25	22.1 +1.9
28.6	23.41 .24	12.3 0.0	7.54 .21	44.0 2.2	61.89 .39	16.5 3.2	13.52 .22	24.0 1.8
Aug. 7.6	23.63 .19	12.4 −0.3	7.73 .17	46.1 2.1	62.24 .31	19.8 3.4	13.72 .19	25.7 1.7
17.6	23.80 .14	12.9 0.6	7.88 .13	48.1 1.9	62.52 .23	23.3 3.5	13.89 .15	27.3 1.5
27.5	23.92 .10	13.6 0.9	7.99 .09	49.9 1.7	62.70 .14	26.9 3.6	14.02 .11	28.7 1.2
Sept. 6.5	23.99 +.05	14.6 −1.1	8.05 +.04	51.5 +1.5	62.80 +.05	30.5 +3.6	14.11 +.07	29.8 +1.0
16.5	24.01 .00	15.9 1.3	8.08 .00	52.9 1.3	62.80 −.04	34.1 3.5	14.16 +.03	30.7 0.8
26.4	23.99 −.04	17.2 1.4	8.06 −.03	54.1 1.0	62.72 .12	37.6 3.4	14.18 .00	31.4 0.6
Oct. 6.4	23.93 .08	18.7 1.5	8.02 .06	55.0 0.8	62.56 .20	40.8 3.1	14.16 −.04	31.8 0.3
16.4	23.83 .11	20.2 1.4	7.94 .09	55.7 0.5	62.32 .27	43.8 2.9	14.10 .06	32.0 +0.1
26.4	23.71 −.13	21.6 −1.4	7.84 −.11	56.1 +0.3	62.02 −.34	46.5 +2.5	14.03 −.09	32.1 −0.1
Nov. 5.3	23.57 .15	23.0 1.3	7.72 .12	56.2 0.0	61.65 .39	48.8 2.0	13.93 .10	31.9 0.3
15.3	23.41 .16	24.1 1.1	7.60 .13	56.2 −0.3	61.23 .44	50.6 1.6	13.83 .11	31.6 0.4
25.3	23.25 .16	25.0 0.8	7.47 .13	55.9 0.4	60.78 .47	51.9 1.0	13.71 .12	31.1 0.6
Dec. 5.3	23.10 .15	25.7 0.6	7.33 .13	55.3 0.7	60.30 .49	52.7 +0.4	13.59 .12	30.4 0.7
15.2	22.95 −.14	26.2 −0.3	7.20 −.12	54.5 −0.9	59.81 −.49	52.8 −0.2	13.46 −.12	29.7 −0.8
25.2	22.82 .12	26.3 0.0	7.08 .11	53.6 1.0	59.32 .48	52.4 0.7	13.35 .11	28.9 0.9
35.2	22.70 −.10	26.2 +0.3	6.97 −.10	52.5 −1.2	58.84 −.46	51.3 −1.3	13.24 −.11	28.0 −0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ι Piscium.		γ Cephei.		Groombridge 4163.		ω Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 23 34	° ′ + 5 0	h m 23 34	° ′ +76 59	h m 23 49	° ′ +73 46	h m 23 53	° ′ + 6 13
	s	″	s	″	s	″	s	″
Jan. 0.2	4.74 −.11	30.8 −0.9	41.30 −.88	64.5 −0.6	18.79 −.69	51.4 −0.5	27.11 −.12	55.7 −0.8
10.2	4.63 .10	29.9 0.9	40.44 .84	63.5 1.3	18.10 .67	50.6 1.1	26.99 .11	54.8 0.9
20.2	4.54 .09	29.0 0.9	39.63 .76	62.0 1.8	17.45 .62	49.2 1.7	26.89 .10	53.9 0.9
30.1	4.46 .07	28.2 0.8	38.92 .65	59.9 2.3	16.87 .54	47.3 2.2	26.79 .08	53.1 0.8
Feb. 9.1	4.40 .05	27.4 0.7	38.32 .52	57.4 2.7	16.37 .44	44.9 2.6	26.72 .06	52.3 0.8
19.1	4.36 −.02	26.7 −0.6	37.87 −.37	54.5 −3.0	15.98 −.33	42.1 −2.9	26.66 −.04	51.6 −0.6
Mar. 1.1	4.36 +.01	26.1 0.4	37.58 .20	51.5 3.1	15.72 .19	39.1 3.1	26.64 −.01	51.0 0.5
11.0	4.38 .04	25.8 −0.2	37.48 −.02	48.3 3.2	15.59 −.05	36.0 3.1	26.64 +.02	50.6 −0.3
21.0	4.44 .08	25.7 0.0	37.55 +.17	45.2 3.1	15.61 +.09	32.9 3.0	26.68 .06	50.5 0.6
30.9	4.54 .12	25.8 +0.3	37.80 .34	42.1 2.9	15.78 .24	29.9 2.9	26.76 .10	50.5 +0.2
Apr. 9.9	4.67 +.15	26.3 +0.6	38.23 +.51	39.4 −2.5	16.09 +.38	27.2 −2.6	26.88 +.14	50.9 +0.5
19.9	4.85 .19	27.0 0.9	38.82 .65	37.0 2.1	16.54 .50	24.8 2.2	27.03 .18	51.5 0.8
29.9	5.06 .23	28.0 1.1	39.54 .78	35.1 1.7	17.10 .61	22.8 1.7	27.23 .21	52.4 1.1
May 9.9	5.30 .26	29.2 1.4	40.38 .88	33.7 1.1	17.76 .70	21.4 1.2	27.46 .24	53.6 1.3
19.8	5.57 .28	30.7 1.6	41.31 .95	32.9 −0.6	18.50 .77	20.4 0.7	27.72 .27	55.0 1.5
29.8	5.86 +.30	32.4 +1.8	42.29 1.00	32.6 0.0	19.30 +.81	20.0 -0.1	28.00 +.29	56.7 +1.7
June 8.8	6.16 .30	34.3 1.9	43.30 1.01	32.9 +0.6	20.13 .83	20.2 +0.5	28.29 .30	58.5 1.9
18.7	6.47 .31	36.2 2.0	44.30 .99	33.8 1.2	20.96 .83	21.0 1.0	28.60 .31	60.4 2.0
28.7	6.77 .30	38.2 2.0	45.28 .95	35.2 1.7	21.78 .80	22.3 1.6	28.91 .30	62.4 2.0
July 8.7	7.06 .28	40.2 2.0	46.19 .88	37.2 2.2	22.57 .75	24.2 2.0	29.20 .29	64.5 2.0
18.7	7.34 +.26	42.2 +1.9	47.03 +.79	39.6 +2.6	23.29 +.69	26.4 +2 5	29.49 +.27	66.4 +1.9
28.6	7.58 .23	44.0 1.8	47.77 .68	42.4 3.0	23.94 .60	29.1 2.9	29.74 .24	68.3 1.8
Aug. 7.6	7.80 .20	45.7 1.6	48.39 .56	45.5 3.2	24.50 .51	32.1 3.2	29.97 .21	70.1 1.7
17.6	7.98 .16	47.2 1.4	48.89 .43	48.9 3.5	24.96 .41	35.4 3.4	30.17 .18	71.7 1.5
27.6	8.12 .12	48.6 1.2	49.24 .29	52.5 3.6	25.32 .30	38.9 3.6	30.33 .14	73.1 1.3
Sept. 6.5	8.23 +.08	49.6 +1.0	49.46 +.14	56.2 +3.7	25.56 +.18	42.5 +3.7	30.45 +.10	74.3 +1.1
16.5	8.29 .04	50.5 0.7	49.53 .00	59.9 3.7	25.68 +.07	46.2 3.7	30.53 .06	75.2 0.8
26.5	8.31 +.01	51.1 0.5	49.46 −.14	63.6 3.6	25.69 −.05	49.9 3.6	30.58 +.03	75.9 0.6
Oct. 6.4	8.30 −.02	51.5 0.3	49.24 .28	67.2 3.5	25.59 .16	53.5 3.5	30.59 −.01	76.4 0.4
16.4	8.26 .05	51.7 +0.1	48.90 .41	70.5 3.2	25.37 .27	56.8 3.3	30.57 .04	76.7 +0.2
26.4	8.20 −.07	51.7 −0.1	48.42 −.54	73.6 +2.9	25.05 −.37	60.0 +3.0	30.52 −.06	76.7 0.0
Nov. 5.4	8.12 .09	51.5 0.3	47.83 .65	76.4 2.5	24.64 .46	62.8 2.6	30.45 .08	76.6 −0.2
15.3	8.02 .11	51.1 0.4	47.13 .74	78.7 2.1	24.13 .54	65.1 2.1	30.36 .10	76.3 0.4
25.3	7.90 .11	50.6 0.6	46.35 .82	80.6 1.5	23.55 .61	67.0 1.6	30.26 .11	75.9 0.5
Dec. 5.3	7.79 .12	50.0 0.7	45.50 .87	81.8 1.0	22.91 .66	68.4 1.1	30.14 .11	75.3 0.6
15.3	7.67 .12	49.3 −0.8	44.61 −.90	82.5 +0.4	22.23 −.69	69.2 +0.5	30.03 −.12	74.6 −0.7
25.2	7.55 .11	48.5 0.8	43.70 .90	82.6 −0.3	21.53 −.70	69.4 −0.1	29.91 .12	73.9 0.8
35.2	7.44 −.11	47.6 −0.9	42.80 −.89	82.0 −0.9	20.82 −.69	69.0 −0.7	29.79 −.11	73.0 −0.8

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Cassiop.	22 Androm.	σ Androm.	ι Ceti.	6 Urs. Min., S. P.	44 Piscium.	π Androm.	ο Cassiop.
	31° 28′	44° 33′	53° 50′	99° 28′	358° 20′	88° 41′	56° 54′	42° 20′
	h m 0 3	h m 0 4	h m 0 12	h m 0 13	h m 0 13	h m 0 19	h m 0 30	h m 0 38
	s	s	s	s	s	s	s	s
(Dec. 30.3)	6.43 − .34	24.10 − .22	22.55 − .17	36.61 − .11	61.79 +7.70	33.28 − .13	47.80 − .18	23.04 − .24
Jan. 9.2	6.10 .32	23.88 .20	22.38 .16	36.50 .11	69.40 7.50	33.15 .12	47.62 .17	22.80 .24
19.2	5.79 .30	23.69 .19	22.22 .16	36.39 .11	76.80 7.15	33.05 .10	47.46 .16	22.55 .23
29.2	5.50 − .28	23.50 − .18	22.06 − .16	36.29 − .10	83.69 +6.55	32.95 − .09	47.30 − .15	22.33 − .22
Aug. 26.6	10.64 + .22	27.67 + .18	25.85 + .18	39.66 + .17	24.35 −3.14	36.24 + .16	50.88 + .18	26.35 + .25
Sept. 5.5	10.83 .16	27.83 .13	26.01 .14	39.81 .13	21.71 2.14	36.39 .14	51.05 .16	26.57 .19
15.5	10.96 .10	27.94 .09	26.13 .10	39.92 .09	20.06 1.12	36.51 .10	51.19 .12	26.73 .14
25.5	11.02 + .04	28.01 + .04	26.20 .05	39.99 .06	19.47 −0.04	36.58 .06	51.28 .07	26.84 .09
Oct. 5.5	11.03 − .02	28.02 − .01	26.22 + .01	40.03 + .02	19.97 +1.05	36.62 + .03	51.33 + .04	26.91 + .04
15.4	10.97 − .08	27.99 − .04	26.22 − .02	40.02 − .02	21.57 +2.15	36.63 .00	51.35 .00	26.93 .00
25.4	10.87 .14	27.93 .08	26.18 .06	39.99 .04	24.26 3.24	36.61 − .04	51.33 − .03	26.91 − .04
Nov. 4.4	10.71 .19	27.83 .12	26.11 .09	39.94 .07	28.05 4.30	36.56 .06	51.29 .06	26.85 .08
14.4	10.50 .23	27.69 .16	26.01 .12	39.86 .09	32.85 5.26	36.49 .08	51.21 .10	26.75 .12
24.3	10.24 .26	27.52 .18	25.88 .14	39.77 .10	38.57 6.11	36.41 .09	51.10 .12	26.61 .16
Dec. 4.3	9.98 − .28	27.34 − .20	25.74 − .15	39.66 − .11	45.07 +6.80	36.31 − .10	50.98 − .13	26.44 − .18
14.3	9.67 .32	27.13 .21	25.58 .17	39.55 .12	52.16 7.30	36.20 .11	50.84 .14	26.25 .20
24.2	9.34 .32	26.92 .22	25.40 .18	39.42 .13	59.68 7.60	36.09 .12	50.69 .16	26.04 .21
34.2	9.02 − .32	26.70 − .22	25.23 − .17	39.30 − .12	67.38 +7.70	35.97 − .12	50.52 − .17	25.82 − .22

Mean Solar Date.	δ Piscium.	γ Cassiop.	μ Androm.	43 Cephei.	κ Tucanæ.	f Piscium.	κ Octantis, S. P.	ν Androm.
	83° 2′	29° 54′	52° 7′	4° 21′	159° 29′	86° 59′	184° 48′	49° 10′
	h m 0 42	h m 0 49	h m 0 50	h m 0 53	h m 1 11	h m 1 11	h m 1 22	h m 1 30
	s	s	s	s	s	s	s	s
(Dec. 30.3)	46.01 − .12	51.06 − .33	26.05 − .18	28.83 −2.84	53.03 − .55	55.19 − .13	44.33 +2.85	7.28 − .17
Jan. 9.2	45.89 .12	50.72 .35	25.87 .19	26.00 2.82	52.48 .55	55.06 .13	46.17 2.83	7.10 .19
19.2	45.76 .12	50.36 .35	25.68 .19	23.18 2.79	51.93 .53	54.93 .13	48.99 2.77	6.90 .22
29.2	45.64 − .12	50.03 − .33	25.49 − .19	20.42 −2.72	51.42 − .49	54.80 − .13	51.71 +2.66	6.66 − .25
Sept. 5.6	48.96 + .14	55.07 + .24	29.23 + .19	44.60 +1.49	56.71 + .38	57.86 + .18	38.97 −1.61	10.16 + .26
15.5	49.09 .12	55.29 .20	29.40 .15	45.89 1.09	57.05 .30	58.02 .14	37.58 1.17	10.39 .20
25.5	49.19 .08	55.46 .13	29.52 .10	46.77 .67	57.31 .21	58.14 .11	36.63 .73	10.55 .15
Oct. 5.5	49.25 .05	55.55 .07	29.60 .06	47.23 + .25	57.47 .12	58.24 .08	36.13 − .25	10.69 .12
15.5	49.29 + .02	55.60 + .02	29.64 + .02	47.27 − .18	57.55 + .04	58.30 .05	36.12 + .24	10.78 .08
25.4	49.29 − .01	55.58 − .05	29.65 − .01	46.86 − .63	57.54 − .06	58.33 + .02	36.62 + .74	10.84 + .05
Nov. 4.4	49.26 .03	55.50 .11	29.62 .05	46.02 1.06	57.43 .16	58.33 − .01	37.60 1.23	10.87 + .01
14.4	49.22 .05	55.36 .17	29.56 .08	44.74 1.47	57.22 .25	58.30 .03	39.09 1.68	10.85 − .04
24.4	49.15 .08	55.16 .22	29.46 .11	43.09 1.85	56.93 .34	58.26 .05	40.96 2.07	10.79 .07
Dec. 4.3	49.06 .09	54.92 .26	29.34 .13	41.05 2.21	56.55 .42	58.19 .08	43.23 2.40	10.70 .10
14.3	48.96 − .10	54.65 − .30	29.20 − .15	38.68 −2.50	56.10 − .49	58.11 − .10	45.76 +2.63	10.59 − .13
24.3	48.85 .11	54.33 .33	29.04 .16	36.06 2.69	55.57 .55	58.00 .11	48.48 2.77	10.44 .16
34.2	48.73 − .12	53.99 − 35	28.87 − .17	33.30 −2.80	55.01 − .57	57.89 − .12	51.30 +2.85	10.27 − .18

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	π Piscium.	ν Piscium.	ζ Ceti.	γ Androm.	β Trianguli.	4 Urs. Min., S. P.	γ Trianguli.	67 Ceti.
	78° 26′	85° 5′	100° 54′	48° 13′	55° 33′	348° 5′	56° 41′	96° 57′
	h m 1 31	h m 1 35	h m 1 45	h m 1 56	h m 2 2	h m 2 9	h m 2 10	h m 2 11
	s	s	s	s	s	s	s	s
(Dec. 30.3)	3.61 − .13	30.18 − .12	50.15 − .13	55.17 − .16	46.53 − .14	13.11 +1.04	33.13 − .12	18.13 − .09
Jan. 9.2	3.48 .13	30.06 .13	50.02 .13	55.00 .18	46.38 .16	14.17 1.06	32.99 .16	18.02 .12
19.2	3.35 .14	29.93 .14	49.89 .14	54.81 .20	46.21 .18	15.28 1.13	32.82 .18	17.89 .14
29.2	3.21 .14	29.79 .13	49.74 .15	54.59 .23	46.02 .19	16.43 1.13	32.63 .19	17.74 .15
Feb. 8.2	3.08 .14	29.66 .12	49.59 .14	54.35 .22	45.83 .19	17.54 1.10	32.45 .19	17.59 .15
18.2	2.94 − .14	29.54 − .11	49.45 − .13	54.16 − .18	45.64 − .19	18.62 +1.06	32.26 − .19	17.44 − .15
Sept. 25.6	6.48 + .14	32.99 + .12	52.79 + .14	58.29 + .20	49.47 + .17	10.72 − .62	35.99 + .18	20.60 + 16
Oct. 5.5	6.60 .10	33.10 .10	52.92 .12	58.47 .15	49.63 .15	10.24 .41	36.16 .16	20.75 .13
15.5	6.68 .06	33.19 .07	53.02 .09	58.59 .11	49.76 .12	9.90 .25	36.30 .13	20.87 .11
25.5	6.73 + .03	33.24 + .04	53.09 + .05	58.69 + .08	49.86 + .09	9.74 − .03	36.41 + 09	20.96 + .08
Nov. 4.5	6.75 + .01	33.27 + .01	53.12 + .02	58.75 + .04	49.93 .05	9.74 + .10	36.48 .06	21.02 .04
14.5	6.75 − .02	33.27 − .02	53.12 − .01	58.77 .00	49.96 + .01	9.94 .30	36.53 + .02	21.04 + .01
24.4	6.71 .04	33.24 .05	53.10 .04	58.75 − .04	49.94 − .03	10.34 .48	36.52 − .02	21.04 − 02
Dec. 4.4	6.66 .06	33.18 .07	53.05 .06	58.69 .08	49 90 .06	10.90 .64	36.49 05	21.01 .05
14.3	6.58 − .09	33.11 − .03	52.98 − .08	58.60 − .11	49.82 − .09	11.62 + .80	36.43 − .08	20.95 − .07
24.3	6.48 .11	33.02 .10	52.88 .11	58.47 .15	49.73 .11	12.50 .94	36.33 .12	20.87 .09
34.2	6.37 − .12	32.91 − .12	52.76 − .13	58.30 − .19	49 59 − .15	13.51 +1.07	36.20 − .14	20.77 − .11

Mean Solar Date.	δ Hydri.	δ Ceti.	μ Hydri.	θ Persei.	σ Arietis.	47 Cephei.	ε Arietis.	β Persei. (*Algol.*)
	159° 11′	90° 9′	169° 36′	41° 15′	75° 23′	11° 2′	69° 7′	49° 29′
	h m 2 19	h m 2 33	h m 2 34	h m 2 36	h m 2 45	h m 2 50	h m 2 52	h m 3 0
	s	s	s	s	s	s	s	s
(Dec. 30.4)	43.61 − .53	38.89 − .10	7.24 −1.14	26.40 − .15	12.65 − .08	64.01 − .74	42.46 − .08	46.40 − .10
Jan. 9.3	43.07 .55	38.78 .12	6.08 1.19	26.22 .21	12.55 .12	63.20 .88	42.36 .12	46.28 .15
19.3	42.50 .57	38.66 .14	4.86 1.22	25.98 .24	12.42 .13	62.26 .99	42.23 .15	46.10 .19
29.3	41.92 .58	38.51 .15	3.63 1.23	25.74 .25	12.28 .15	61.23 1.05	42.07 .16	45.89 .21
Feb. 8.2	41.35 .57	38.36 .15	2.41 1.21	25.48 .26	12.12 .16	60.17 1.07	41.91 .17	45.67 .22
18.2	40.79 − .56	38.20 − .16	1.22 −1.17	25.22 − .26	11.96 − .16	59.09 −1.09	41.74 − .18	45.45 − .22
Sept. 25.6	45.86 + .36	41.20 + .18	8.89 + .73	29.39 + .28	15.00 + .21	69.62 + .88	44.82 + 22	49.01 + .26
Oct. 5.6	46.17 .26	41.37 .16	9.52 .53	29.65 .23	15.19 .17	70.44 .74	45.02 .18	49.25 .22
15.5	46.39 .16	41.51 .13	9.95 .32	29.86 .18	15.34 .14	71.13 .61	45.19 .16	49.46 .19
25.5	46.50 + .06	41.62 + .10	10.15 + .10	30.02 + .14	15.47 + .11	71.66 + .46	45.34 + .13	49.63 + 16
Nov. 4.5	46.50 − .06	41.70 .07	10.14 − .13	30 15 .10	15.57 .09	72.05 .28	45.45 .10	49.78 .12
14.5	46.39 .17	41.76 .04	9.89 .35	30.22 .05	15.65 .06	72.21 + .09	45 53 .06	49.88 .08
24.4	46.17 .26	41.78 + .01	9.43 .56	30.26 + .01	15.69 + .02	72.23 − .08	45.58 + .03	49.95 + .04
Dec. 4.4	45.87 35	41.77 − .02	8.78 .74	30.23 − .05	15.69 − .01	72.04 .29	45.60 .00	49.97 .00
14.4	45.48 − .42	41.73 − .05	7.95 − .91	30.17 − .10	15.67 − .04	71.66 − .48	45.58 − .03	49.95 − .04
24.4	45.03 .49	41.67 .07	6.96 1.04	30.04 .14	15.62 .07	71.07 .66	45.53 .06	49.89 .08
34.3	44.51 − .55	41.59 − .09	5.88 −1.11	29.89 − .17	15.53 − .11	70.35 − .78	45.45 − .10	49.78 − .13

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Mean Solar Date.	ρ Octantis, S. P	ι Hydri.	f Tauri.	γ Camelop.	γ Hydri.	ε Persei.	A¹ Tauri.	o Persei.
	185° 55′	167° 48′	77° 27′	19° 1′	164° 35′	50° 19′	68° 14′	42° 35′
	h m	h m	h m	h m	h m	h m	h m	h m
	3 17	3 18	3 24	3 38	3 48	3 50	3 57	4 0
	s	s	s	s	s	s	s	s
(Dec. 30.4)	3.81 +2.14	51.35 − .85	35.57 − .08	23.94 − .29	63.43 − .59	13.66 − .07	58.46 − .04	24.91 − .06
Jan. 9.3	6.01 2.26	50.45 .95	35.48 .10	23.60 .39	62.79 .69	13.57 .11	58.40 .08	24.82 .12
19.3	8.33 2.38	49.45 1.03	35.37 .13	23.16 .49	62.05 .78	13.44 .15	58.30 .12	24.66 .18
29.3	10.77 2.44	48.39 1.07	35.22 .15	22.63 .55	61.24 .84	13.26 .19	58.16 .15	24.46 .22
Feb. 8.3	13.21 2.44	47.31 1.08	35.06 .16	22.06 .59	60.37 .88	13.05 .21	58.00 .17	24.22 .24
18.2	15.66 +2.40	46.23 −1.07	34.89 − .17	21.46 − .61	59.48 − .89	12.83 − .23	57.83 − .18	23.97 − .26
28.2	18.01 +2.29	45.16 −1.07	34.72 − .17	20.85 − .62	58.59 − .89	12.59 − .24	57.64 − .19	23.70 − .27
Oct. 5.6	10.24 −1.14	51.39 + .64	37.83 + .21	27.77 + .60	62.60 + .59	16.10 + .28	60.57 + .26	27.42 + .30
15.6	9.27 .80	51.94 .46	38.02 .17	28.33 .52	63.13 .48	16.37 .26	60.81 .22	27.72 .29
25.5	8.65 − .41	52.32 + .28	38.18 + .15	28.81 + .44	63.55 + .35	16.61 + .23	61.02 + .19	28.01 + .27
Nov. 4.5	8.46 + .03	52.50 + .09	38.32 .13	29.20 .35	63.84 .21	16.82 .19	61.19 .16	28.26 .23
14.5	8.71 .46	52.51 − .10	38.44 .10	29.50 .23	63.97 + .06	16.98 .15	61.35 .14	28.46 .18
24.5	9.38 .87	52.31 .28	38.52 .06	29.67 .12	63 96 − .08	17.11 .11	61.47 .10	28.61 .13
Dec. 4.4	10.44 1.26	51.95 .46	38.56 + .02	29.74 + .01	63.80 .23	17.20 .07	61.55 .07	28.71 .08
14.4	11.90 +1.62	51.39 − .63	38.57 − .01	29.70 − .10	63.50 − .38	17.24 + .01	61.60 + .03	28.77 + .02
24.4	13.67 1.90	50.69 .78	38.55 .04	29.52 .23	63.03 .52	17.22 − .04	61.61 − .01	28.75 − .04
34.4	15.70 +2.16	49.84 − .93	38.49 − .08	29.24 − .35	62.46 − .62	17.17 − .07	61.58 − .05	28.70 − .08

Mean Solar Date.	o¹ Eridani.	η Urs. Min., S. P.	m Persei.	δ Mensæ.	τ Tauri.	i Tauri.	ζ Aurigæ.	β Eridani.
	97° 8′	346° 1′	47° 11′	170° 29′	67° 16′	71° 21′	49° 5′	95° 14′
	h m	h m	h m	h m	h m	h m	h m	h m
	4 6	4 20	4 25	4 25	4 35	4 44	4 54	5 2
	s	s	s	s	s	s	s	s
(Dec. 30.4)	18.93 − .05	45.07 + .48	25.29 − .04	48.17 − .86	25.36 − .01	43.47 .00	32.16 + .01	15.80 .00
Jan. 9.4	18.87 .08	45.62 .62	25.23 .08	47.21 1.06	25.33 .05	43.45 − .04	32.14 − .05	15.78 − .04
19.4	18.77 .10	46 31 .76	25.12 .13	46.05 1.22	25.26 .10	43.39 .08	32.06 .11	15.72 .08
29.3	18.66 .13	47.13 .85	24.96 .18	44.77 1.34	25.14 .13	43.29 .12	31.93 .16	15.63 .11
Feb. 8.3	18.50 .16	48.01 .92	24.75 .22	43.38 1.42	25.00 .16	43.15 .15	31.75 .20	15.50 .15
18.3	18.34 − .18	48.96 + .96	24.52 − .24	41.94 −1.46	24.83 − .19	42.99 − .17	31.53 − .22	15.34 − .17
28.2	18.15 .19	49.93 .97	24.28 .25	40.47 1.46	24.63 .20	42.81 .19	31.30 .23	15.16 .18
Mar. 10.2	17.97 − .18	50.87 + .96	24.03 − .26	39.02 −1.43	24.44 − .19	42.61 − .21	31.06 − .24	14.97 − .19
Oct. 15.6	20.85 + .20	44.70 − .74	27.81 + .30	44.39 + .90	27.48 + .27	45.47 + .24	34.42 + .32	17.34 + .22
25.6	21.04 + .17	44.03 − .60	28.10 + .28	45.19 + .70	27.73 + .23	45.71 + .23	34.73 + .30	17.56 + .22
Nov. 4.6	21.20 .15	43.51 .45	28.37 .25	45.79 .48	27.95 .20	45.94 .21	35.02 .28	17.78 .20
14.5	21.34 .13	43.13 .30	28.59 .20	46.16 + .24	28.13 .17	46.13 .17	35.28 .24	17.95 .18
24.5	21.46 .10	42.91 − .14	28.76 .16	46.27 − .02	28.29 .14	46.29 .14	35.49 .19	18.13 .16
Dec. 4.5	21.53 .05	42.86 + .04	28.90 .11	46.13 27	28.42 .10	46.42 .11	35.65 .15	18.26 .12
14.4	21.56 + .01	42.99 + .21	28.98 + .06	45.74 − .51	28.50 + .06	46.52 + .07	35.78 + .10	18.35 + .08
24.4	21.56 − .02	43.28 .39	29.01 + .01	45.12 .74	28.54 + .02	46.57 + .03	35.85 + .05	18.41 + .04
34.4	21.52 − .06	43.76 + .56	28.99 − .04	44.27 − .97	28.54 − .02	46.58 − .02	35.87 .00	18.42 − .01

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Mean Solar Date.	τ Orionis.	χ Aurigæ.	Groombr. 944.	κ Orionis.	ν Aurigæ.	δ Doradus.	β Aurigæ.	θ Aurigæ.
	96° 58′	57° 54′	4° 52′	99° 43′	50° 53′	155° 47′	45° 4′	52° 48′
	h m	h m	h m	h m	h m	h m	h m	h m
	5 12	5 25	5 25	5 42	5 43	5 44	5 51	5 51
	s	s	s	s	s	s	s	s
(Dec. 30.4)	5.37 + .01	19.94 + .04	49.23 − .27	22.14 + .04	36.82 + .07	37.46 − .15	11.67 + .09	58.37 + .06
Jan. 9.4	5.36 − .03	19.96 − .01	48.72 .75	23.16 − .01	36.86 .00	37.27 .23	11.72 + .01	58.42 + .02
19.4	5.31 .07	19.93 .06	47.73 1.23	22.12 .05	36.83 − .06	37.00 .31	11.69 − .06	58.40 − .04
29.4	5.22 .12	19.84 .11	46.26 1.66	22.05 .10	36.75 .11	36.64 .40	11.61 .11	58.33 .10
Feb. 8.3	5.08 .15	19.71 .15	44.42 2.00	21.93 .14	36.62 .15	36.21 .47	11.47 .17	58.21 .14
18.3	4.93 − .17	19.54 − .18	42.26 −2.27	21.78 − .16	36.45 − .19	35.70 − .52	11.27 − .21	58.05 − .18
28.3	4.75 .18	19.35 .21	39.88 2.44	21.61 .17	36.23 .22	35.17 .55	11.05 .24	57.84 .21
Mar. 10.3	4.56 .19	19.12 .23	37.38 2.50	21.43 .18	36.00 .23	34.60 .57	10.79 .26	57.62 .22
20.2	4.37 − .19	18.90 − .22	34.87 −2.51	21.24 − .19	35.77 − .24	34.03 − .57	10.53 − .26	57.40 − .23
Oct. 25.6	7.06 + .23	22.18 + .29	57.21 +2.38	23.61 + .25	39.03 + .34	36.28 + .48	13.94 + .37	60.50 + .33
Nov. 4.6	7.28 .21	22.46 .27	59.52 2.21	23.85 .23	39.36 .31	36.72 .40	14.30 .34	60.82 .31
14.6	7.48 .19	22.71 .24	61.63 1.91	24.07 .21	39.66 .28	37.09 .32	14.63 .31	61.12 .28
24.5	7.65 .16	22.94 .20	63.35 1.50	24.28 .18	39.92 .24	37.37 .23	14.92 .27	61.38 .25
Dec. 4.5	7.79 .12	23.12 .16	64.62 1.04	24.43 .14	40.15 .20	37.55 .14	15.18 .23	61.62 .21
14.5	7.88 + .08	23.27 + .12	65.44 + .56	24.56 + .10	40.32 + .15	37.64 + .04	15.38 + .17	61.80 + .16
24.5	7.94 + .04	23.36 .07	65.74 + .07	24.64 .06	40.45 .10	37.63 − .06	15.52 .12	61.94 .11
34.4	7.96 .00	23.42 + .03	65.58 − .39	24.68 + .02	40.53 + .06	37.51 − .17	15.61 + .06	62.03 + .06

Mean Solar Date.	η Geminor.	ψ¹ Aurigæ.	ν Geminor.	χ Draconis, S. P.	ε Geminor.	ψ⁵ Aurigæ.	θ Geminor.	ζ Mensæ.
	67° 28′	40° 39′	69° 43′	342° 41′	64° 45′	46° 19′	55° 54′	170° 42′
	h m	h m	h m	h m	h m	h m	h m	h m
	6 7	6 16	6 22	6 23	6 36	6 38	6 45	6 49
	s	s	s	s	s	s	s	s
(Dec. 30.5)	61.07 + .09	8.89 + .13	12.88 + .09	2.36 + .02	56.33 + .12	32.81 + .15	17.87 + .13	40.60 − .13
Jan. 9.5	61.13 + .03	8.98 + .04	12.95 + .05	2.45 .16	56.42 .07	32.92 + .07	17.98 .08	40.33 .41
19.4	61.14 − .03	8.98 − .03	12.97 − .01	2.68 .30	56.46 + .01	32.95 .00	18.04 + .02	39.82 .65
29.4	61.08 .08	8.92 .10	12.93 .06	3.06 .44	56.44 − .04	32.93 − .06	18.02 − .04	39.06 .86
Feb. 8.4	60.99 .11	8.79 .16	12.86 .11	3.56 .54	56.37 .09	32.84 .12	17.96 .09	38.11 1.06
18.3	60.87 − .14	8.61 − .21	12.74 − .14	4.17 + .62	56.26 − .13	32.70 − .17	17.85 − .14	36.95 −1.23
28.3	60.71 .17	8.37 .25	12.59 .17	4.80 .70	56.12 .16	32.51 .21	17.69 .18	35.66 1.35
Mar. 10.3	60.53 .20	8.10 .26	12.41 .18	5.54 .74	55.94 .19	32.28 .24	17.49 .21	34.26 1.45
20.3	60.32 .20	7.81 .29	12.22 .19	6.28 .77	55.74 .20	32.04 .26	17.28 .22	32.77 1.50
30.2	60.13 .19	7.52 .28	12.03 .19	7.07 .78	55.54 .20	31.77 .25	17.05 .23	31.26 1.52
Apr. 9.2	59.94 − .18	7.24 − .27	11.85 − .18	7.83 + .73	55.35 − .19	31.54 − .21	16.82 − .23	29.74 −1.53
Nov. 14.6	63.45 + .27	11.83 + .37	15.14 + .28	2.73 − .56	58.62 + .29	35.46 + .36	20.29 + .32	34.02 + .96
24.6	63.70 .24	12.18 .32	15.40 .24	2.22 .46	58.90 .26	35.80 .32	20.60 .30	34.90 .78
Dec. 4.6	63.92 .20	12.48 .27	15.63 .20	1.81 .35	59.15 .23	36.10 .28	20.88 .26	35.57 .55
14.5	64.09 + .15	12.73 + .22	15.81 + .17	1.53 − .21	59.37 + .20	36.36 + .24	21.12 + .21	36.00 + .29
24.5	64.22 .11	12.92 .16	15.97 .13	1.39 − .07	59.53 .16	36.57 .18	21.30 .16	36.16 + .02
34.5	64.31 + .07	13.05 + .10	16.07 + .09	1.40 + .07	59.66 + .11	36.72 + .12	21.45 + .11	36.05 − .24

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH PÓLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Geminor.	63 Aurigæ.	25 Camelop.	γ^2 Volantis.	β Canis Minoris.	26 Lyncis.	Groombr. 1374.	ω^1 Cancri.
	69° 16′ h m 6 57	50° 30′ h m 7 3	7° 22′ h m 7 7	160° 19′ h m 7 9	81° 29′ h m 7 20	42° 9′ h m 7 46	15° 47′ h m 7 46	64° 18′ h m 7 54
	s	s	s	s	s	s	s	s
(Dec. 30.5)	22.06 + .14	50.20 + .17	11.15 + .65	47.42 + .06	59.25 + .14	25.92 + .23	35.18 + .50	3.09 + .18
Jan. 9.5	22.17 .09	50.34 .11	11.62 + .29	47.41 − .06	59.37 .10	26.12 .17	35.59 .31	3.25 .13
19.5	22.23 + .03	50.42 + .04	11.72 − .06	47.27 .19	59.45 + .05	26.26 .10	35.80 + .14	3.36 .09
29.4	22.23 − .02	50.42 − .02	11.50 .40	47.02 .31	59.47 .00	26.33 + .03	35.87 − .01	3.43 + .04
Feb. 8.4	22.19 .07	50.37 .08	10.93 .73	46.65 .41	59.44 − .05	26.32 − .04	35.77 .19	3.44 − .02
18.4	22.10 − .11	50.27 − .13	10.05 −1.02	46.19 − .51	59.37 − .09	26.25 − .10	35.49 − .34	3.39 − .07
28.4	21.96 .15	50.11 .18	8.90 1.25	45.63 .59	59.26 .13	26.11 .17	35.09 .47	3.31 .11
Mar. 10.4	21.81 .17	49.90 .21	7.55 1.43	45.01 .64	59.12 .15	25.91 .22	34.55 .59	3.18 .15
20.3	21.62 .19	49.68 .23	6.05 1.54	44.35 .67	58.96 .17	25.68 .25	33.92 .66	3.00 .18
30.3	21.43 .19	49.44 .24	4.48 1.59	43.66 .89	58.78 .18	25.42 .27	33.23 .71	2.82 .18
Apr. 9.2	21.24 − .18	49.21 − .22	2.87 −1.58	42.97 − .68	58.60 − .17	25.15 − .26	32.51 − .72	2.64 − .18
19.2	21.06 − .17	49.01 − .18	1.32 −1.50	42.30 − .67	58.43 − .16	24.89 − .25	31.79 − .72	2.46 − .18
Nov. 24.6	24.48 + .26	52.97 + .33	18.56 +1.62	45.92 + .49	61.37 + .26	28.64 + .42	39.06 + .89	5.36 + .32
Dec. 4.6	24.74 .24	53.28 .29	20.07 1.40	46.35 .37	61.62 .24	29.04 .37	39.90 .80	5.67 .29
14.6	24.96 + .20	53.56 + .25	21.37 +1.14	46.67 + .26	61.85 + .21	29.39 + .33	40.65 + .70	5.95 + .26
24.5	25.14 .16	53.79 .20	22.35 .83	46.86 .13	62.05 .18	29.70 .28	41.29 .57	6.20 .22
34.5	25.28 + .12	53.95 + .13	23.03 + .55	46.93 + .01	62.20 + .13	29.95 + .23	41.78 + .43	6.40 + .17

Mean Solar Date.	ζ^1 Cancri.	β Cancri.	30 Monocerotis.	θ Chamæleontis.	σ Hydræ.	γ Cancri.	σ^2 Cancri.	θ Hydræ.
	72° 1′ h m 8 5	80° 28′ h m 8 10	93° 32′ h m 8 19	167° 7′ h m 8 24	86° 16′ h m 8 32	68° 7′ h m 8 36	59° 0′ h m 8 47	87° 13′ h m 9 8
	s	s	s	s	s	s	s	s
(Dec. 30.6)	41.45 + .17	20.98 + .18	58.92 + .18	9.64 + .32	49.00 + .19	42.23 + .22	18.17 + .26	26.89 + .25
Jan. 9.6	41.61 .14	21.14 .14	59.08 .14	9.88 + .16	49.17 .15	42.43 .18	18.40 .20	27.11 .19
19.5	41.71 .10	21.27 .10	59.20 .10	9.97 − .01	49.32 .12	42.59 .13	18.58 .15	27.27 .14
29.5	41.82 + .05	21.34 + .05	59.27 + .05	9.86 .20	49.41 .07	42.70 .08	18.70 .10	27.39 .10
Feb. 8.5	41.84 − .01	21.36 .00	59.29 .00	9.58 .37	49.45 + .02	42.75 + .03	18.77 + .05	27.47 + .05
18.4	41.81 − .06	21.33 − .05	59.27 − .05	9.12 − .54	49.44 − .02	42.75 − .02	18.79 − .01	27.50 .00
28.4	41.73 .10	21.26 .09	59.20 .09	8.50 .68	49.38 .08	42.70 .07	18.74 .07	27.47 − .05
Mar. 10.4	41.61 .13	21.15 .13	59.09 .12	7.76 .79	49.29 .11	42.61 .11	18.65 .12	27.41 .08
20.4	41.46 .16	21.01 .15	58.96 .14	6.92 .88	49.17 .14	42.47 .14	18.51 .15	27.31 .11
30.3	41.29 .17	20.85 .16	58.80 .16	6.00 .95	49.02 .15	42.32 .16	18.35 .16	27.19 .13
Apr. 9.3	41.12 − .18	20.69 − .17	58.63 − .17	5.02 − .99	48.86 − .16	42.15 − .17	18.18 − .18	27.05 − .14
19.3	40.94 .17	20.52 .17	58.46 .17	4.01 1.02	48.70 .16	41.98 .17	17.99 .19	26.90 .15
29.3	40.78 .16	20.35 .15	58.30 .16	2.99 1.01	48.54 .16	41.81 .17	17.81 .18	26.75 .15
May 9.2	40.63 − .14	20.21 − .13	58.15 − .15	1.99 − .98	48.39 − .15	41.65 − .16	17.64 − .17	26.60 − .15

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Argus.	α Lyncis.	10 Leonis Minoris.	ο Leonis.	ζ Chamæleontis.	19 Leonis Minoris.	π Leonis.	λ Ursæ Majoris.
	159° 15′	55° 8′	53° 6′	79° 35′	170° 26′	48° 24′	81° 25′	46° 31′
	h m 9 11	h m 9 14	h m 9 27	h m 9 35	h m 9 37	h m 9 50	h m 9 54	h m 10 10
	s	s	s	s	s	s	s	s
(Dec. 30.6)	60.91 + .41	7.21 + .30	14.96 + .30	4.67 + .26	21.56 + .87	42.54 + .34	11.98 + .27	13.49 + .37
Jan. 9.6	61.26 .28	7.48 .24	15.24 .26	4.91 .22	22.31 .63	42.86 .30	12.23 .23	13.84 .33
19.6	61.47 .16	7.70 .19	15.49 .21	5.10 .18	22.83 .40	43.14 .25	12.45 .19	14.15 .28
29.5	61.59 + .05	7.86 .13	15.66 .15	5.26 .13	23.11 + .17	43.36 .18	12.61 .14	14.39 .21
Feb. 8.5	61.57 − .07	7.96 .07	15.78 .09	5.37 .06	23.17 − .06	43.50 .12	12.74 .10	14 57 .15
18.5	61.45 − .18	8.00 + .02	15.84 + .03	5.42 + .03	22.98 − .29	43.59 + .06	12.81 + .05	14.68 + .09
28.5	61.21 .29	7.99 − .04	15.84 − .02	5.43 − .02	22.59 .50	43.62 .00	12.84 .00	14.74 + .03
Mar. 10.4	60.87 .37	7.92 .10	15.79 .08	5.39 .06	21.98 .70	43.59 − .06	12.82 − .04	14.73 − .04
20.4	60.47 .44	7.80 .14	15.67 .13	5.31 .09	21.19 .86	43.50 .11	12.76 .07	14.66 .10
30.4	59.99 .50	7.65 .16	15.53 .16	5.21 .11	20.25 1.01	43.37 .15	12.67 .10	14.54 .14
Apr. 9.3	59.46 − .54	7.48 − .18	15.36 − .18	5.08 − .13	19.18 −1.13	43.21 − .18	12.56 − .12	14.39 − .16
19.3	58.91 .57	7.29 .19	15.18 .19	4.94 .14	18.00 1.21	43.02 .19	12.42 .13	14.21 .19
29.3	58.33 .58	7.10 .19	14.98 .19	4.79 .15	16.76 1.26	42.82 .20	12.29 .14	14.01 .21
May 9.3	57.75 .58	6.91 .18	14.80 .18	4.65 .14	15.48 1.29	42.62 .20	12.15 .14	13.79 .21
19.2	57.17 − .58	6.74 − .16	14.62 − .17	4.51 − .14	14.18 −1.30	42.42 − .20	12.01 − .14	13.60 − .18

Mean Solar Date.	μ Hydræ.	β Leonis Minoris.	α Antliæ.	β Octantis, S. P.	41 Leonis Minoris.	δ² Chamæleontis.	46 Leonis Minoris.	Groombr. 1706.
	106° 15′	52° 43′	120° 29′	188° 1′	66° 13′	169° 56′	55° 10′	11° 37′
	h m 10 20	h m 10 21	h m 10 21	h m 10 34	h m 10 37	h m 10 44	h m 10 46	h m 10 50
	s	s	s	s	s	s	s	s
Jan. 19.6	35.97 + .20	18.31 + .26	57.72 + .20	9.16 − .69	13.88 + .24	50.83 + .77	56.88 + .28	50.29 + .93
29.6	36.15 .16	18.55 .21	57.90 .16	8.59 .45	14.10 .20	51.50 .57	57.14 .23	51.14 .77
Feb. 8.6	36.30 .12	18.72 .15	58.04 .12	8.27 − .20	14.27 .15	51.97 .36	57.33 .17	51.82 .57
18.5	36.39 .07	18.84 .10	58.13 .07	8.19 + .03	14.40 .10	52.21 + .14	57.48 .13	52.28 .36
28.5	36.43 + .02	18.91 + .04	58.17 + .01	8.34 .26	14.48 + .05	52.26 − .06	57.58 .07	52.53 + .15
Mar. 10.5	36.43 − .02	18.91 − .02	58.15 − .04	8.72 + .50	14.50 − .01	52.09 − .25	57.61 + .01	52.57 − .06
20.4	36.39 .06	18.87 .06	58.10 .07	9.34 .72	14.48 .05	51.75 .44	57.60 − .04	52.40 .26
30.4	36.31 .09	18.78 .11	58.01 .10	10.17 .93	14.42 .08	51.21 .61	57.54 .08	52.04 .45
Apr. 9.4	36.21 .11	18.65 .14	57.89 .13	11.21 1.12	14.33 .10	50.53 .75	57.44 .11	51.49 .61
19.4	36.09 .12	18.50 .16	57.75 .15	12.42 1.29	14.22 .12	49.70 .88	57.32 .13	50.82 .73
29.3	35.96 − .13	18.33 − .17	57.59 − .16	13.79 +1.43	14.09 − .14	48.77 − .99	57.17 − .15	50.03 − .83
May 9.3	35.82 .14	18.16 .18	57.43 .16	15.29 1.55	13.94 .15	47.72 1.06	57.02 .16	49.16 .89
19.3	35.68 .14	17.98 .17	57.27 .17	16.87 1.62	13.80 .14	46.64 1.11	56.85 .17	48.24 .92
29.3	35.54 .13	17.81 .16	57.10 .15	18.52 1.65	13.66 .13	45.50 1.15	56.68 .15	47.31 .91
June 8.2	35.41 − .12	17.65 − .15	56.96 − .13	20.18 +1.66	13.54 − .11	44.33 −1.18	56.54 − .13	46.41 − .89

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Octantis.	p³ Leonis.	ψ Urs. Maj.	ν Urs. Maj.	ξ Hydræ.	χ Urs. Maj.	π Virginis.	ε Corvi.
	173° 59′	87° 26′	44° 53′	56° 17′	121° 13′	41° 35′	82° 45′	111° 59′
	h m 11 0	h m 11 1	h m 11 3	h m 11 12	h m 11 27	h m 11 40	h m 11 55	h m 12 4
	s	s	s	s	s	s	s	s
Feb. 8.6	20.84 + .68	6.63 + .14	16.35 + .20	20.48 + .21	25.51 + .18	2.79 + .29	2.95 + .20	17.29 + .19
18.6	21.36 .35	6.76 .12	16.53 .15	20.66 .15	25.67 .14	3.04 .21	3.13 .16	17.47 .17
28.5	21.55 + .03	6.87 .08	16.66 .10	20.78 .10	25.79 .10	3.21 .14	3.28 .12	17.63 .14
Mar. 10.5	21.42 − .30	6.91 + .03	16.72 + .08	20.85 + .04	25.86 .05	3.32 .08	3.38 .08	17.74 .09
20.5	20.95 .61	6.92 − .01	16.72 − .03	20.86 − .01	25.88 + .01	3.37 + .02	3.44 .05	17.81 .05
30.4	20.21 − .89	6.88 − .04	16.66 − .08	20.83 − .05	25.87 − .03	3.36 − .03	3.47 + .02	17.84 + .01
Apr. 9.4	19.17 1.17	6.83 .07	16.56 .12	20.76 .08	25.82 .06	3.30 .08	3.47 − .02	17.84 − .01
19.4	17.88 1.40	6.74 .09	16.43 .15	20.66 .12	25.74 .09	3.19 .13	3.43 .06	17.81 .04
29.4	16.37 1.60	6.64 .10	16.26 .18	20.53 .13	25.64 .11	3.04 .16	3.36 .08	17.76 .07
May 9.3	14.69 1.74	6.53 .11	16.07 .20	20.39 .15	25.52 .13	2.86 .19	3.28 .09	17.68 .09
19.3	12.88 −1.87	6.41 − .12	15.87 − .20	20.23 − .15	25.38 − .14	2.66 − .20	3.19 − .09	17.58 − .10
29.3	10.95 1.95	6.29 .12	15.66 .20	20.08 .15	25.24 .15	2.45 .22	3.09 .10	17.48 .11
June 8.3	8.98 1.97	6.17 .12	15.47 .19	19.92 .15	25.08 .15	2.22 .22	2.98 .11	17.36 .12
18.2	7.02 −1.95	6.06 − .11	15.28 − .18	19.77 − .14	24.93 − .14	2.01 − .21	2.87 − .10	17.24 − .12

Mean Solar Date.	2 Can. Ven.	6 Urs. Min.	δ² Corvi.	β Can. Ven.	γ Virginis, (*mean.*)	31 Cor. Bor.	γ Cassiop., S. P.	43 Cephei, S. P.
	48° 42′	1° 40′	105° 53′	48° 1′	90° 49′	61° 50′	330° 6′	355° 39′
	h m 12 10	h m 12 14	h m 12 23	h m 12 28	h m 12 35	h m 12 46	h m 12 49	h m 12 53
	s	s	s	s	s	s	s	s
Feb. 8.6	25.62 + .29	30.04 +6.35	59.35 + .24	20.46 + .30	54.18 + .10	9.54 + .28	49.72 − .33	17.78 −2.40
18.6	25.88 .22	35.13 4.61	59.56 .18	20.73 .24	54.30 .13	9.80 .24	49.43 .24	15.56 2.02
28.6	26.07 .16	39.02 3.38	59.72 .14	20.95 .18	54.46 .15	10.01 .19	49.23 .18	13.74 1.60
Mar. 10.5	26.21 .11	41.64 2.04	59.85 .11	21.10 .13	54.60 .12	10.17 .14	49.07 .13	12.37 1.12
20.5	26.30 .06	42.83 + .62	59.95 .07	21.21 .08	54.70 .08	10.29 .10	48.98 − .06	11.50 .60
30.5	26.33 + .01	42.61 − .76	60.00 + .03	21.27 + .04	54.77 + .05	10.36 + .06	48.96 + .03	11.18 − .04
Apr. 9.5	26.33 − .03	41.04 2.10	60.02 .00	21.28 − .01	54.80 + .01	10.40 + .02	49.05 .13	11.43 + .49
19.4	26.27 .07	38.18 3.33	60.01 − .02	21.24 .06	54.80 − .02	10.39 − .02	49.22 .20	12.16 1.00
29.4	26.18 .11	34.17 4.41	59.98 .04	21.17 .09	54.77 .04	10.36 .05	49.45 .28	13.42 1.48
May 9.4	26.05 .14	29.18 5.32	59.92 .07	21.06 .12	54.73 .06	10.29 .07	49.78 .35	15.13 1.90
19.3	25.90 − .15	23.38 −6.04	59.84 − .08	20.93 − .14	54.66 − .07	10.21 − .09	50.16 + .40	17.22 +2.25
29.3	25.75 .16	17.01 6.56	59.75 .09	20.77 .16	54.59 .08	10.11 .11	50.59 .45	19.64 2.53
June 8.3	25.57 .18	10.21 6.88	59.65 .10	20.60 .18	54.50 .10	9.99 .12	51.07 .50	22.28 2.73
18.3	25.39 − .19	3.24 −6.95	59.54 − .11	20.41 − .20	54.39 − .12	9.86 − .14	51.60 + .55	25.09 +2.87

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Muscæ.	ε Virginis.	20 Can. Ven.	κ Octantis.	B.A.C. 4536.	m Virginis.	θ Apodis.	π Hydræ.
	160° 56′	78° 26′	48° 50′	175° 12′	52° 14′	98° 8′	166° 15′	116° 8′
	h m 12 54	h m 12 56	h m 13 12	h m 13 22	h m 13 29	h m 13 35	h m 13 54	h m 13 59
	s	s	s	s	s	s	s	s
Feb. 28.6	31.70 + .43	31.40 + .16	26.91 + .26	58.59 +1.80	43.36 + .25	39.05 + .21	21.26 + .79	54.44 + .23
Mar. 10.6	32.08 .32	31.55 .14	27.12 .20	60.23 1.48	43.59 .20	39.24 .17	21.99 .68	54.66 .21
20.6	32.35 .23	31.68 .11	27.29 .14	61.52 1.10	43.75 .15	39.39 .14	22.61 .54	54.87 .18
30.5	32.53 .12	31.76 .07	27.39 .08	62.43 .71	43.89 .11	39.52 .11	23.08 .41	55.02 .14
Apr. 9.5	32.60 + .03	31.81 + .04	27.46 + .04	62.94 + .32	43.98 .06	39.62 .08	23.43 .29	55.15 .11
19.5	32.58 − .06	31.83 .00	27.47 .00	63.08 − .06	44.01 + .02	39.68 + .04	23.66 + .15	55.25 + .08
29.5	32.48 .15	31.81 − .03	27.46 − .04	62.82 .45	44.02 − .02	39.71 + .02	23.74 + .02	55.32 .05
May 9.4	32.28 .23	31.78 .05	27.39 .08	62.19 .83	43.98 .05	39.72 − .01	23.70 − .11	55.35 + .02
19.4	32.01 .30	31.72 .07	27.30 .10	61.17 1.18	43.92 .08	39.70 .03	23.52 .23	55.36 − .01
29.4	31.67 .37	31.65 .08	27.18 .14	59.84 1.47	43.82 .12	39.66 .05	23.23 .35	55.34 .03
June 8.3	31.26 − .43	31.56 − .10	27.03 − .16	58.22 −1.77	43.69 − .14	39.60 − .07	22.82 − .47	55.30 − .06
18.3	30.80 .49	31.46 .11	26.87 .17	56.30 2.00	43.55 .15	39.53 .09	22.29 .57	55.22 .09
28.3	30.27 .51	31.34 .12	26.69 .18	54.21 2.19	43.40 .17	39.43 .11	21.68 .65	55.13 .11
July 8.3	29.78 − .47	31.22 − .12	26.50 − .19	51.92 −2.30	43.22 − .19	39.32 − .12	21.00 − .72	55.00 − .14

Mean Solar Date.	d Bootis.	κ Virginis.	δ Octantis.	4 Urs. Min.	λ Bootis.	λ Virginis.	α Apodis.	μ Hydri, S. P.
	64° 22′	99° 45′	173° 9′	11° 55′	43° 23′	102° 51′	168° 34′	190° 24′
	h m 14 5	h m 14 6	h m 14 8	h m 14 9	h m 14 12	h m 14 12	h m 14 33	h m 14 33
	s	s	s	s	s	s	s	s
Mar. 20.6	13.35 + .18	50.50 + .17	59.60 +1.15	21.17 + .59	4.33 + .21	58.13 + .19	52.73 + .85	58.20 − .83
30.6	13.51 .14	50.66 .14	60.65 .92	21.67 .42	4.52 .16	58.30 .15	53.50 .70	57.46 .66
Apr. 9.5	13.62 .10	50.79 .11	61.45 .65	22.00 .23	4.66 .11	58.43 .12	54.12 .54	56.89 .48
19.5	13.70 .06	50.88 .08	61.96 .38	22.13 + .05	4.75 .07	58.54 .09	54.58 .38	56.50 .29
29.5	13.75 .04	50.95 .05	62.22 + .12	22.09 − .14	4.80 + .02	58.61 .06	54.89 .22	56.31 − .10
May 9.4	13.78 + .01	50.98 + .03	62.20 − .16	21.84 − .32	4.79 − .03	58.66 + .03	55.02 + .06	56.31 + .10
19.4	13.76 − .03	51.00 + .01	61.90 .42	21.45 .47	4.74 .07	58.67 .00	55.01 − .10	56.52 .29
29.4	13.71 .06	50.99 − .02	61.35 .68	20.90 .61	4.65 .11	58.67 − .02	54.82 .26	56.90 .48
June 8.4	13.64 .08	50.95 .05	60.53 .93	20.23 .72	4.52 .14	58.63 .04	54.48 .42	57.48 .66
18.3	13.55 .10	50.89 .07	59.49 1.14	19.45 .82	4.37 .17	58.58 .06	53.98 .55	58.22 .82
28.3	13.45 − .12	50.81 − .09	58.24 −1.32	18.58 − .90	4.18 − .20	58.50 − .09	53.37 − .68	59.12 + .95
July 8.3	13.31 .14	50.71 .11	56.84 1.48	17.65 .95	3.97 .22	58.40 .11	52.62 .80	60.13 1.07
18.3	13.17 .15	50.59 .12	55.28 1.60	16.68 .98	3.74 .23	58.28 .12	51.78 .89	61.25 1.15
28.2	13.01 − .17	50.46 − .14	53.61 −1.68	15.69 −1.00	3.51 − .23	58.15 − .13	50.85 − .97	62.42 +1.20

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	33 Bootis.	47 Cephei, S. P.	γ Scorpii.	δ Bootis.	ρ Octantis.	β Cor. Bor.	γ Camelop., S. P.	δ¹ Apodis.
	45° 6′ h m 14 34	348° 58′ h m 14 50	114° 50′ h m 14 57	56° 15′ h m 15 10	174° 5′ h m 15 17	60° 30′ h m 15 23	340° 59′ h m 15 38	168° 24′ h m 16 3
	s	s	s	s	s	s	s	s
Mar. 30.6	37.15 + .20	55.71 − .54	25.85 + .19	55.78 + .19	24.17 +1.69	9.04 + .20	19.29 − .45	27.24 +1.08
Apr. 9.6	37.32 .14	55.27 .34	26.03 .17	55.96 .16	25.72 1.41	9.23 .18	18.92 .30	28.25 .94
19.5	37.43 .09	55.04 − .13	26.19 .15	56.11 .13	26.99 1.13	9.39 .15	18.70 .16	29.12 .80
29.5	37.50 .05	55.02 + .09	26.33 .12	56.23 .10	27.97 .82	9.53 .12	18.58 − .05	29.86 .66
May 9.5	37.54 + .01	55.22 .32	26.42 .08	56.31 .07	28.62 .49	9.62 .08	18.60 + .08	30.44 .51
19.5	37.52 − .04	55.66 + .53	26.49 + .06	56.36 + .03	28.95 + .16	9.69 + .04	18.75 + .21	30.87 + .34
29.4	37.45 .08	56.27 .71	26.53 + .02	56.36 − .01	28.93 − .16	9.71 .00	19.02 .33	31.12 + .17
June 8.4	37.35 .11	57.07 .86	26.53 − .01	56.33 .05	28.59 .51	9.69 − .03	19.41 .46	31.21 .00
18.4	37.23 .14	57.99 1.00	26.50 .04	56.26 .08	27.91 .83	9.65 .06	19.94 .55	31.12 − .18
28.4	37.06 .18	59.06 1.12	26.44 .07	56.17 .11	26.93 1.13	9.57 .09	20.51 .62	30.84 .36
July 8.3	36.88 − .20	60.23 +1.20	26.35 − .10	56.04 − .14	25.65 −1.40	9.47 − .12	21.18 + .70	30.40 − .51
18.3	36.65 .22	61.46 1.25	26.24 .12	55.98 .16	24.14 1.63	9.33 .15	21.91 .74	29.83 .65
28.3	36.43 .23	62.72 1.27	26.11 .14	55.72 .18	22.40 1.80	9.17 .17	22.67 .77	29.10 .78
Aug. 7.3	36.18 .24	64.00 1.26	25.95 .16	55.52 .20	20.54 1.91	9.00 .18	23.46 .79	28.27 .88
17.2	35.94 .24	65.24 1.23	25.79 .17	55.31 .21	18.59 1.94	8.80 .20	24.25 .78	27.33 .95
27.2	35.70 − .23	66.46 +1.20	25.61 − .19	55.10 − .21	16.65 −1.92	8.60 − .21	25.03 + .77	26.37 − .98

Mean Solar Date.	φ Herculis.	σ Cor. Bor. (*mean.*)	γ Apodis.	η Urs. Min.	η Ophiuchi.	π Herculis.	θ Ophiuchi.	δ Aræ.
	44° 46′ h m 16 5	55° 51′ h m 16 10	168° 38′ h m 16 16	13° 59′ h m 16 20	105° 35′ h m 17 3	53° 4′ h m 17 11	114° 53′ h m 17 15	150° 35′ h m 17 20
	s	s	s	s	s	s	s	s
Apr. 9.6	11.94 + .24	25.87 + .23	6.96 +1.01	53.30 + .63	51.79 + .28	5.77 + .28	1.93 + .31	51.12 + .51
19.6	12.16 .20	26.08 .19	7.90 .87	53.87 .51	52.05 .25	6.04 .26	2.22 .27	51.61 .48
29.6	12.34 .16	26.25 .16	8.71 .74	54.32 .38	52.28 .22	6.29 .22	2.47 .24	52.07 .44
May 9.6	12.48 .12	26.39 .13	9.35 .57	54.62 .22	52.49 .20	6.49 .18	2.69 .21	52.48 .38
19.5	12.59 .08	26.51 .09	9.85 .43	54.76 + .08	52.68 .17	6.66 .15	2.90 .19	52.84 .33
29.5	12.63 + .03	26.57 + .04	10.18 + .24	54.75 − .09	52.82 + .13	6.79 + .11	3.07 + .16	53.14 + .26
June 8.5	12.64 − .02	26.59 + .01	10.32 + .05	54.58 .24	52.94 .10	6.87 .07	3.21 .13	53.36 .19
18.4	12.59 .07	26.59 − .03	10.28 − .13	54.27 .39	53.03 .07	6.93 + .03	3.32 .09	53.51 .12
28.4	12.50 .12	26.53 .07	10.05 .31	53.80 .52	53.08 + .03	6.93 − .02	3.38 .05	53.60 + .05
July 8.4	12.36 .16	26.45 .10	9.66 .47	53.23 .63	53.08 − .01	6.89 .06	3.41 + .01	53.60 − .03
18.4	12.19 − .19	26.32 − .14	9.10 − .63	52.54 − .73	53.06 − .04	6.80 − .11	3.39 − .04	53.53 − .11
28.3	11.98 .22	26.16 .17	8.40 .76	51.77 .81	52.99 .08	6.67 .15	3.33 .08	53.38 .18
Aug. 7.3	11.74 .24	25.98 .20	7.58 .88	50.91 .88	52.89 .12	6.50 .19	3.23 .12	53.16 .25
17.3	11.49 .27	25.76 .22	6.63 .96	50.01 .92	52.76 .15	6.29 .21	3.09 .15	52.88 .31
27.3	11.20 .28	25.54 .22	5.65 1.00	49.07 .94	52.60 .17	6.07 .23	2.93 .17	52.55 .35
Sept. 6.2	10.93 − .27	25.31 − .23	4.64 −1.00	48.12 − .94	52.43 − .18	5.82 − .25	2.75 − .19	52.18 − .37
16.2	10.66 .26	25.08 .23	3.65 .96	47.18 .91	52.24 .19	5.57 .25	2.55 .20	51.80 .38
26.2	10.40 .24	24.86 .23	2.71 .88	46.31 .84	52.05 .17	5.32 .24	2.36 .19	51.41 .37
Oct. 6.2	10.17 − .22	24.61 − .24	1.88 − .76	45.50 − .76	51.89 − .14	5.08 − .23	2.18 − .17	51.05 − .34

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombr. 944,S.P.	ι Herculis.	θ Herculis.	o Herculis.	λ Sagittarii.	χ Draconis.	ζ Pavonis.	γ Lyræ.
	355° 8′	43° 56′	52° 44′	61° 15′	115° 29′	17° 19′	161° 31′	57° 28′
	h m 17 25	h m 17 36	h m 17 52	h m 18 3	h m 18 20	h m 18 23	h m 18 29	h m 18 54
	s	s	s	s	s	s	s	s
May 19.6	24.88 − .56	17.06 + .18	22.61 + .18	7.69 + .18	58.28 + .24	10.27 + .44	47.54 + .63	42.61 + .26
29.6	24.56 − .08	17.22 .14	22.77 .15	7.86 .16	58.51 .22	10.64 .30	48.12 .54	42.85 .22
June 8.5	24.72 + .40	17.33 .09	22.90 .12	8.01 .13	58.72 .18	10.88 .19	48.62 .45	43.04 .18
18.5	25.36 .86	17.40 + .04	23.00 .07	8.11 .09	58.88 .14	11.02 + .07	49.01 .34	43.20 .14
28.5	26.43 1.28	17.41 − .02	23.04 + .02	8.19 + .05	59.00 .10	11.02 − .06	49.30 .22	43.32 .10
July 8.5	27.91 +1.67	17.37 − .07	23.04 − .02	8.21 .00	59.09 + .06	10.90 − .19	49.45 + .10	43.39 + .05
18.4	29.76 2.00	17.27 .12	22.99 .07	8.19 − .04	59.13 + .02	10.64 .31	49.49 − .03	43.42 .00
28.4	31.90 2.30	17.13 .17	22.90 .12	8.12 .08	59.12 − .03	10.28 .42	49.40 .15	43.39 − .05
Aug. 7.4	34.36 2.56	16.92 .21	22.76 .16	8.02 .12	59.07 .07	9.80 .52	49.18 .27	43.32 .09
17.4	37.02 2.74	16.70 .24	22.58 .20	7.87 .16	58.98 .11	9.24 .61	48.86 .36	43.21 .13
27.3	39.84 +2.89	16.43 − .27	22.37 − .22	7.70 − .19	58.85 − .15	8.58 − .68	48.43 − .46	43.05 − .18
Sept. 6.3	42.79 2.98	16.15 .29	22.13 .24	7.49 .21	58.68 .17	7.87 .74	47.92 .54	42.86 .21
16.3	45.80 3.01	15.84 .30	21.88 .25	7.28 .22	58.50 .19	7.10 .78	47.34 .60	42.64 .22
26.3	48.81 2.98	15.54 .30	21.62 .26	7.05 .23	58.30 .20	6.31 .79	46.72 .62	42.41 .23
Oct. 6.2	51.75 2.89	15.24 .28	21.37 .25	6.83 .22	58.10 .20	5.52 .79	46.10 .61	42.18 .24
16.2	54.59 +2.77	14.97 − .26	21.12 − .24	6.61 − .21	57.91 − .19	4.73 − .78	45.49 − .60	41.94 − .24

Mean Solar Date.	ι Lyræ.	25 Camelop. S. P.	θ Lyræ.	β Cygni.	β Sagittæ.	δ Cygni.	Groombr. 1374,S.P.	ε Pavonis.
	54° 5′	352° 38′	52° 4′	62° 17′	72° 47′	45° 9′	344° 13′	163° 13′
	h m 19 3	h m 19 6	h m 19 12	h m 19 26	h m 19 35	h m 19 41	h m 19 46	h m 19 47
	s	s	s	s	s	s	s	s
May 29.6	16.16 + .23	56.70 − .70	26.73 + .24	9.41 + .23	57.60 + .25	26.88 + .27	29.53 − .39	28.33 + .77
June 8.6	16.37 .18	56.15 .40	26.95 .20	9.63 .21	57.83 .21	27.14 .25	29.20 .27	29.05 .67
18.6	16.53 .14	55.90 − .11	27.12 .16	9.82 .18	58.02 .18	27.37 .20	29.00 − .14	29.68 .58
28.5	16.66 .10	55.93 + .17	27.26 .12	9.98 .13	58.20 .15	27.53 .14	28.93 .00	30.21 .47
July 8.5	16.74 + .05	56.24 .45	27.35 .06	10.08 .08	58.32 .10	27.65 .09	28.99 + .12	30.61 .34
18.5	16.76 .00	56.83 + .73	27.38 + .01	10.15 + .04	58.40 + .06	27.72 + .03	29.18 + .24	30.89 + .20
28.5	16.74 − .04	57.71 .99	27.37 − .04	10.16 − .01	58.44 + .02	27.71 − .02	29.48 .37	31.01 + .06
Aug. 7.4	16.68 .09	58.81 1.20	27.31 .09	10.13 .05	58.43 − .02	27.67 .07	29.92 .49	31.00 − .08
17.4	16.56 .14	60.11 1.41	27.19 .14	10.06 .10	58.39 .06	27.56 .12	30.46 .59	30.86 .21
27.4	16.41 .18	61.63 1.60	27.04 .18	9.94 .14	58.29 .11	27.42 .18	31.09 .69	30.57 .34
Sept. 6.3	16.21 − .21	63.33 +1.76	26.84 − .22	9.78 − .17	58.17 − .14	27.20 − .23	31.83 + .78	30.17 − .46
16.3	15.98 .24	65.16 1.87	26.60 .24	9.60 .19	58.01 .17	26.96 .25	32.64 .84	29.65 .56
26.3	15.73 .25	67.07 1.95	26.36 .25	9.40 .21	57.83 .18	26.71 .27	33.51 .91	29.05 .62
Oct. 6.3	15.49 .25	69.07 2.02	26.10 .26	9.17 .22	57.65 .19	26.42 .29	34.45 .95	28.41 .66
16.2	15.24 .25	71.10 2.06	25.85 .25	8.96 .21	57.45 .20	26.14 .29	35.41 .96	27.73 .68
26.2	14.99 − .23	73.08 +2.03	25.60 − .24	8.75 − .20	57.26 − .18	25.85 − .29	36.37 + .97	27.05 − .66
Nov. 5.2	14.79 − .20	75.06 +1.92	25.37 − .22	8.56 − .18	57.09 − .16	25.56 − .29	37.35 + .99	26.41 − .62

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Sagittæ.	o Sagittarii.	θ Aquilæ.	31 Cygni.	α Delphini.	β Pavonis.	ψ Capricor.	ε Cygni.
	70° 49′ h m 19 53	118° 2′ h m 19 55	91° 10′ h m 20 5	43° 36′ h m 20 10	74° 29′ h m 20 34	156° 37′ h m 20 34	115° 41′ h m 20 39	56° 27′ h m 20 41
	s	s	s	s	s	s	s	s
June 18.6	43.53 + .18	41.23 + .25	27.55 + .19	5.17 + .20	22.73 + .22	44.17 + .52	22.78 + .27	38.25 + .25
28.6	43.70 .16	41.46 .20	27.73 .17	5.36 .18	22.94 .19	44.65 .44	23.03 .24	38.48 .21
July 8.5	43.85 .13	41.63 .16	27.90 .15	5.53 .14	23.12 .16	45.05 .36	23.25 .20	38.67 .17
18.5	43.95 .08	41.78 .12	28.02 .10	5.63 .07	23.26 .12	45.38 .27	23.42 .15	38.81 .12
28.5	44.00 + .03	41.86 .06	28.10 .06	5.66 + .01	23.35 .07	45.60 .15	23.55 .10	38.90 .07
Aug. 7.5	44.01 − .01	41.90 + .01	28.13 + .01	5.65 − .04	23.40 + .03	45.71 + .06	23.63 + .05	38.94 + .02
17.4	43.98 .06	41.88 − .04	28.12 − .03	5.58 .10	23.41 − .02	45.72 − .04	23.66 .00	38.94 − .02
27.4	43.90 .10	41.82 .08	28.07 .07	5.45 .16	23.37 .06	45.63 .15	23.64 − .04	38.89 .07
Sept. 6.4	43.78 .13	41.72 .12	27.98 .12	5.27 .21	23.29 .10	45.43 .24	23.58 .08	38.79 .12
16.4	43.64 .16	41.58 .16	27.86 .14	5.04 .24	23.18 .13	45.15 .32	23.48 .12	38.65 .16
26.3	43.46 − .18	41.41 − .18	27.71 − .15	4.79 − .26	23.03 − .15	44.80 − .39	23.34 − .15	38.47 − .18
Oct. 6.3	43.27 .19	41.23 .19	27.56 .16	4.51 .28	22.88 .17	44.37 .44	23.18 .17	38.29 .20
16.3	43.08 .20	41.03 .20	27.39 .17	4.23 .29	22.70 .18	43.92 .46	23.00 .18	38.06 .22
26.3	42.88 .19	40.84 .19	27.22 .17	3.94 .29	22.52 .17	43.45 .47	22.82 .18	37.85 .21
Nov. 5.2	42.70 .17	40.66 .17	27.05 .15	3.65 .28	22.35 .16	42.98 .46	22.64 .17	37.64 .20
15.2	42.55 − .14	40.51 − .14	26.91 − .13	3.39 − .26	22.20 − .15	42.53 − .43	22.48 − .16	37.44 − .19
25.2	42.43 − .11	40.38 − .11	26.80 − .10	3.14 − .25	22.05 − .14	42.13 − .38	22.33 − .14	37.25 − .18

Mean Solar Date.	τ Cygni.	ζ Capricor.	74 Cygni.	λ^1 Octantis.	ζ Chamæleontis, S.P.	π^2 Cygni.	16 Pegasi.	π Pegasi.
	52° 26′ h m 21 10	112° 54′ h m 21 20	50° 6′ h m 21 32	173° 15′ h m 21 33	189° 34′ h m 21 37	41° 13′ h m 21 42	64° 37′ h m 21 47	57° 23′ h m 22 4
	s	s	s	s	s	s	s	s
July 8.6	17.24 + .19	11.83 + .23	25.60 + .21	27.99 +1.37	8.54 − .84	37.99 + .26	55.00 + .24	58.07 + .26
18.6	17.41 .14	12.04 .18	25.79 .17	29.23 1.12	7.80 .66	38.22 .20	55.21 .18	58.30 .20
28.5	17.53 .10	12.20 .14	25.94 .13	30.22 .84	7.22 .46	38.38 .14	55.36 .14	58.47 .15
Aug. 7.5	17.61 + .06	12.32 .10	26.05 .08	30.90 .50	6.88 .24	38.50 .09	55.48 .11	58.61 .11
17.5	17.64 .00	12.39 + .05	26.09 + .02	31.22 + .16	6.73 − .03	38.56 + .03	55.57 .06	58.70 .07
27.5	17.61 − .05	12.41 .00	26.09 − .03	31.23 − .16	6.81 + .21	38.55 − .03	55.60 + .01	58.75 + .02
Sept. 6.4	17.53 .10	12.39 − .04	26.03 .08	30.90 .50	7.15 .44	38.50 .08	55.58 − .04	58.74 − .02
16.4	17.41 .14	12.33 .08	25.93 .12	30.22 .83	7.69 .64	38.39 .14	55.52 .08	58.70 .06
26.4	17.25 .17	12.22 .12	25.79 .16	29.24 1.11	8.43 .85	38.22 .20	55.43 .11	58.61 .11
Oct. 6.4	17.07 .20	12.09 .14	25.62 .19	28.00 1.36	9.39 1.05	38.00 .23	55.30 .14	58.49 .14
16.3	16.85 − .22	11.94 − .16	25.42 − .21	26.53 −1.54	10.52 +1.20	37.77 − .24	55.16 − .16	58.34 − .16
26.3	16.63 .22	11.77 .17	25.19 .23	24.93 1.66	11.78 1.29	37.52 .26	54.99 .17	58.17 .18
Nov. 5.3	16.41 .21	11.60 .16	24.97 .22	23.22 1.71	13.10 1.34	37.25 .27	54.82 .17	57.99 .19
15.3	16.20 .20	11.45 .15	24.75 .21	21.50 1.70	14.47 1.36	36.97 .27	54.65 .16	57.80 .19
25.2	16.00 .19	11.30 .14	24.55 .20	19.81 1.63	15.83 1.33	36.71 .26	54.49 .15	57.61 .18
Dec. 5.2	15.81 − .18	11.17 − .12	24.34 − .20	18.24 −1.50	17.12 +1.25	36.45 − .25	54.34 − .14	57.44 − .16

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ν Octantis.	γ Aquarii.	σ Aquarii.	α Lacertæ.	10 Lacertæ.	β Octantis.	λ Pogasi.	Groombr. 1706, S.P.
	176° 33′	91° 58′	101° 16′	40° 18′	51° 33′	171° 59′	67° 2′	348° 23′
	h m 22 9	h m 22 15	h m 22 24	h m 22 26	h m 22 34	h m 22 34	h m 22 41	h m 22 50
	s	s	s	s	s	s	s	s
July 8.6	43.66 +2.98	48.23 + .26	38.83 + .26	38.72 + .31	11.40 + .28	24.95 +1 37	4.71 + .27	44.03 − .66
18.6	46.39 2.50	48.46 .20	39.07 .22	39.01 .26	11.66 .24	26.26 1.24	4.96 .24	43.42 .53
28.6	48.66 1.99	48.64 .16	39.28 .18	39.25 .20	11.88 .20	27.42 1.04	5.18 .19	42.97 .40
Aug. 7.6	50.37 1.42	48.79 .14	39.44 .14	39.42 .14	12.05 .15	28.33 .80	5.34 .15	42.63 .27
17.5	51.50 .81	48.92 .10	39.57 .10	39.54 .09	12.18 .10	29.01 .54	5.47 .11	42.43 − .13
27.5	51.99 + .16	48.99 + .05	39.65 + .06	39.60 + .04	12.26 + .05	29.40 + .25	5.56 + .07	42.37 + .01
Sept. 6.5	51.82 − .51	49.01 + .01	39.69 + .02	39.61 − .02	12.28 .00	29.52 − .03	5 61 + .03	42.46 .18
16.5	50.97 1.15	49.00 − .03	39.69 − .02	39.56 .07	12.26 − .04	29.34 .33	5.61 − .02	42.74 .35
26.4	49.53 1.74	48.95 .07	39.65 .06	39.46 .11	12.20 .08	28.86 .60	5.57 .06	43.15 .50
Oct. 6.4	47.48 2.30	48.87 .09	39.57 .09	39.33 .16	12.10 .12	28.15 .83	5.50 .09	43.73 .64
16.4	44.93 −2.75	48.77 − .11	39.48 − .11	39.14 − .20	11.96 − .14	27.19 −1.04	5.40 − .11	44.42 + .79
26.3	41.98 3.10	48.65 .13	39.35 .13	38.92 .23	11.81 .16	26.04 1.23	5.28 .13	45.30 .92
Nov. 5.3	38.72 3.34	48.51 .14	39.22 .14	38.68 .25	11.63 .18	24.74 1.35	5.14 .14	46.27 1.03
15.3	35.31 3.42	48.37 .13	39.08 .14	38.42 .26	11.43 .19	23.34 1.42	5.00 .14	47.35 1.14
25.3	31.87 3.40	48.25 .13	38.95 .13	38.17 .26	11.24 .20	21.89 1.43	4.85 .15	48.55 1.21
Dec. 5.2	28.50 −3.30	48.12 − .12	38.82 − .12	37.91 − .25	11.04 − .20	20.47 −1.39	4.70 − .14	49.77 +1.24
15.2	25.38 −3.14	48.01 − .10	38.70 − .11	37.66 − .25	10.84 − .20	19.10 −1.34	4.56 − .13	51.02 +1.27

Mean Solar Date.	o Androm.	φ Aquarii.	τ Pegasi.	λ Androm.	i¹ Aquarii.	δ Sculptoris.	γ¹ Octantis.	33 Piscium.
	48° 17′	96° 40′	66° 53′	44° 10′	108° 55′	118° 46′	172° 39′	96° 21′
	h m 22 56	h m 23 8	h m 23 15	h m 23 32	h m 23 38	h m 23 43	h m 23 45	h m 23 59
	s	s	s	s	s	s	s	s
July 28.6	43.75 + .22	27.49 + .21	2.36 + .22	2.40 + .28	19.48 + .26	1.34 + .27	26.03 +1.45	32.16 + .24
Aug. 7.6	43.95 .18	27.68 .18	2.56 .18	2.66 .24	19.72 .22	1.59 .23	27.38 1.25	32.39 .22
17.6	44.11 .14	27.84 .14	2.72 .14	2.87 .18	19.91 .18	1.81 .19	28.52 1.02	32.61 .19
27.5	44.22 .08	27.96 .10	2.84 .10	3.02 .13	20.07 .14	1.97 .14	29.41 .75	32.76 .14
Sept. 6.5	44.28 + .03	28.04 .06	2.92 .06	3.13 .09	20.18 .10	2.10 .10	30.02 .45	32.89 .11
16.5	44.28 − .01	28.08 + .02	2.96 + .02	3.19 + .04	20.26 + .06	2.18 + .06	30.32 + .15	32.98 + .08
26.5	44.25 .05	28.08 − .01	2.97 − .02	3.20 − .02	20.29 + .01	2.21 + .02	30.33 − .16	33.04 + .04
Oct. 6.4	44.17 .09	28.06 .04	2.93 .05	3.16 .06	20.28 − .02	2.22 − .02	30.00 .48	33.05 .00
16.4	44.07 .13	28.00 .08	2.87 .08	3.08 .10	20.24 .06	2.17 .06	29.38 .76	33.03 − .03
26.4	43.91 .16	27.91 .10	2.77 .11	2.97 .13	20.17 .08	2.09 .10	28.48 1.02	32.99 .06
Nov. 5.4	43.74 − .18	27.80 − .11	2.66 − .12	2.82 − .16	20.07 − .10	1.98 − .12	27.34 −1.24	32.92 − .08
15.3	43.55 .20	27.68 .12	2.53 .13	2.65 .19	19.96 .12	1.86 .13	26.00 1.41	32.83 .09
25.3	43.34 .21	27.57 .12	2.39 .14	2.44 .21	19.84 .13	1.73 .14	24.52 1.53	32.74 .10
Dec. 5.3	43.13 .20	27.44 .12	2.25 .14	2.22 .22	19.71 .13	1.58 .15	22.95 1.59	32.63 .11
15.3	42.93 .20	27.32 .11	2.11 .14	2.01 .22	19.58 .13	1.43 .15	21.34 1.60	32.51 .12
25.2	42.74 − .20	27.21 − .10	1.97 − .13	1.79 − .22	19.45 − .12	1.28 − .14	19.75 −1.54	32.39 − .12
35.2	42.54 − .20	27.12 − .08	1.84 − .13	1.57 − .22	19.33 − .11	1.14 − .14	18.27 −1.42	32.27 − .12

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.		Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
		Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
		h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Jan.	0	18 44 39.05	39.70	−23 3 15.9	15.3	11.046	+11.79	+ 3 30.41	16 18.36	1 11.10	18 41 8.72
	1	18 49 4.04	4.77	22 58 19.3	18.5	11.034	12.93	3 58.84	16 18.36	1 11.06	18 45 5.28
	2	18 53 28.71	29.53	22 52 55.2	54.2	11.021	14.07	4 26.95	16 18.35	1 11.01	18 49 1.84
	3	18 57 53.02	53.93	22 47 3.7	2.5	11.005	15.21	4 54.72	16 18.34	1 10.96	18 52 58.39
	4	19 2 16.94	17.93	22 40 45.1	43.7	10.988	16.34	5 22.09	16 18.32	1 10.91	18 56 54.95
	5	19 6 40.44	41.51	−22 33 59.6	58.0	10.970	+17.45	+ 5 49.03	16 18.30	1 10.85	19 0 51.51
	6	19 11 3.48	4.63	22 26 47.3	45.4	10.950	18.56	6 15.52	16 18.27	1 10.79	19 4 48.07
	7	19 15 26.03	27.25	22 19 8.5	6.3	10.928	19.66	6 41.52	16 18.24	1 10.72	19 8 44.63
	8	19 19 48.05	49.34	22 11 3.4	0.9	10.906	20.75	7 7.00	16 18.21	1 10.65	19 12 41.18
	9	19 24 9.53	10.89	22 2 32.3	29.5	10.883	21.83	7 31.92	16 18.18	1 10.57	19 16 37.74
	10	19 28 30.43	31.86	−21 53 35.3	32.2	10.858	+22.90	+ 7 56.27	16 18.14	1 10.49	19 20 34.29
	11	19 32 50.73	52.23	21 44 12.8	9.4	10.832	23.96	8 20.02	16 18.10	1 10.41	19 24 30.85
	12	19 37 10.41	11.97	21 34 25.1	21.4	10.806	25.01	8 43.14	16 18.05	1 10.33	19 28 27.40
	13	19 41 29.43	31.06	21 24 12.4	8.4	10.779	26.04	9 5.61	16 17.99	1 10.25	19 32 23.96
	14	19 45 47.79	49.48	21 13 34.9	30.6	10.751	27.06	9 27.41	16 17.93	1 10.16	19 36 20.52
	15	19 50 5.46	7.21	−21 2 33.0	28.4	10.722	+28.07	+ 9 48.52	16 17.87	1 10.07	19 40 17.08
	16	19 54 22.43	24.24	20 51 7.1	2.1	10.693	29.07	10 8.94	16 17.80	1 9.97	19 44 13.63
	17	19 58 38.68	40.54	20 39 17.4	12.1	10.662	30.05	10 28.64	16 17.72	1 9.87	19 48 10.19
	18	20 2 54.20	56.11	20 26 64.3	58.7	10.631	31.02	10 47.61	16 17.64	1 9.77	19 52 6.74
	19	20 7 8.98	10.94	20 14 28.0	22.1	10.600	31.98	11 5.83	16 17.55	1 9.67	19 56 3.30
	20	20 11 23.01	25.02	−20 1 28.9	22.6	10.568	+32.92	+11 23.30	16 17.46	1 9.56	19 59 59.85
	21	20 15 36.28	38.33	19 48 7.4	0.8	10.537	33.85	11 40.01	16 17.36	1 9.46	20 3 56.41
	22	20 19 48.79	50.88	19 34 23.8	16.9	10.505	34.77	11 55.96	16 17.26	1 9.35	20 7 52.96
	23	20 24 0.54	2.66	19 20 18.4	11.2	10.473	35.67	12 11.14	16 17.14	1 9.24	20 11 49.52
	24	20 28 11.51	13.67	19 5 51.7	44.1	10.441	36.55	12 25.54	16 17.02	1 9.13	20 15 46.08
	25	20 32 21.70	23.89	−18 50 63.9	56.0	10.409	+37.42	+12 39.17	16 16.90	1 9.02	20 19 42.63
	26	20 36 31.10	33.32	18 35 55.5	47.3	10.376	38.27	12 52.02	16 16.77	1 8.91	20 23 39.19
	27	20 40 39.71	41.96	18 20 26.8	18.3	10.343	39.10	13 4.07	16 16.64	1 8.80	20 27 35.75
	28	20 44 47.52	49.79	18 4 38.2	29.3	10.310	39.92	13 15.32	16 16.50	1 8.68	20 31 32.30
	29	20 48 54.54	56.83	17 48 30.1	20.9	10.277	40.72	13 25.77	16 16.36	1 8.57	20 35 28.86
	30	20 53 0.76	3.07	−17 31 63.0	53.5	10.243	+41.51	+13 35.43	16 16.21	1 8.45	20 39 25.41
	31	20 57 6.18	8.51	17 15 17.2	7.4	10.209	42.28	13 44.29	16 16.06	1 8.34	20 43 21.97
Feb.	1	21 1 10.78	13.13	16 58 13.1	3.1	10.175	43.03	13 52.34	16 15.91	1 8.22	20 47 18.52
	2	21 5 14.57	16.93	16 40 51.1	40.9	10.141	43.77	13 59.57	16 15.76	1 8.11	20 51 15.07
	3	21 9 17.55	19.92	16 23 11.7	1.2	10.107	44.50	14 5.98	16 15.60	1 7.99	20 55 11.62
	4	21 13 19.71	22.09	−16 5 15.3	4.6	10.073	+45.19	+14 11.58	16 15.44	1 7.88	20 59 8.18
	5	21 17 21.06	23.45	15 46 62.3	51.4	10.039	45.87	14 16.36	16 15.28	1 7.76	21 3 4.73
	6	21 21 21.59	23.98	15 28 33.2	22.1	10.005	46.54	14 20.32	16 15.11	1 7.65	21 7 1.29
	7	21 25 21.30	23.69	15 9 48.4	37.1	9.971	47.18	14 23.47	16 14.94	1 7.53	21 10 57.84
	8	21 29 20.20	22.59	14 50 48.2	36.7	9.937	47.81	14 25.81	16 14.77	1 7.42	21 14 54.40
	9	21 33 18.29	20.68	−14 31 33.1	21.4	9.904	+48.42	+14 27.34	16 14.59	1 7.31	21 18 50.95
	10	21 37 15.58	17.96	14 11 63.6	51.7	9.871	49.01	14 28.07	16 14.41	1 7.20	21 22 47.51
	11	21 41 12.07	14.44	13 52 20.1	8.1	9.838	49.59	14 28.01	16 14.23	1 7.09	21 26 44.06
	12	21 45 7.78	10.14	13 32 23.0	10.9	9.805	50.15	14 27.16	16 14.05	1 6.98	21 30 40.61
	13	21 49 2.72	5.07	13 12 12.6	0.4	9.773	50.70	14 25.54	16 13.86	1 6.87	21 34 37.16
	14	21 52 56.90	59.24	−12 51 49.4	37.1	9.741	+51.23	+14 23.16	16 13.67	1 6.76	21 38 33.72
	15	21 56 50.32	52.65	−12 31 13.8	1.4	9.711	+51.73	+14 20.02	16 13.47	1 6.66	21 42 30.27

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0ˢ.19 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Feb. 15	21 56 50.32	52.65	−12 31 13.8	1.4	9.711	+51.73	+14 20.02	16 13.47	1 6.66	21 42 30.27
16	22 0 43.02	45.33	12 10 26.3	13.8	9.681	52.22	14 16.15	16 13.27	1 6.55	21 46 26.83
17	22 4 35.00	37.29	11 49 27.2	14.7	9.651	52.69	14 11.57	16 13.06	1 6.45	21 50 23.38
18	22 8 26.28	28.55	11 28 16.9	4.3	9.622	53.14	14 6.29	16 12.84	1 6.35	21 54 19.93
19	22 12 16.87	19.12	11 6 55.8	43.2	9.594	53.59	14 0.33	16 12.62	1 6.26	21 58 16.48
20	22 16 6.80	9.03	−10 45 24.3	11.7	9.567	+54.01	+13 53.70	16 12.40	1 6.16	22 2 13.04
21	22 19 56.09	58.29	10 23 42.8	30.2	9.540	54.41	13 46.44	16 12.18	1 6.07	22 6 9.59
22	22 23 44.76	46.93	10 1 51.7	39.1	9.515	54.81	13 38.55	16 11.95	1 5.98	22 10 6.14
23	22 27 32.82	34.95	9 39 51.4	38.9	9.490	55.19	13 30.05	16 11.72	1 5.89	22 14 2.69
24	22 31 20.28	22.38	9 17 42.3	29.9	9.466	55.55	13 20.95	16 11.49	1 5.80	22 17 59.25
25	22 35 7.17	9.24	− 8 55 24.7	12.4	9.442	+55.90	+13 11.29	16 11.25	1 5.71	22 21 55.80
26	22 38 53.51	55.55	8 32 59.2	46.9	9.419	56.22	13 1.08	16 11.01	1 5.63	22 25 52.35
27	22 42 39.32	41.33	8 10 26.0	13.9	9.398	56.52	12 50.34	16 10.76	1 5.54	22 29 48.90
28	22 46 24.61	26.59	7 47 45.7	33.7	9.377	56.82	12 39.07	16 10.52	1 5.47	22 33 45.46
Mar. 1	22 50 9.39	11.34	7 24 58.5	46.6	9.356	57.10	12 27.29	16 10.27	1 5.40	22 37 42.01
2	22 53 53.69	55.60	− 7 1 64.9	53.1	9.336	+57.35	+12 15.03	16 10.02	1 5.33	22 41 38.57
3	22 57 37.51	39.38	6 38 65.3	53.7	9.316	57.60	12 2.30	16 9.77	1 5.26	22 45 35.12
4	23 1 20.88	22.71	6 15 60.1	48.6	9.297	57.82	11 49.11	16 9.51	1 5.20	22 49 31.67
5	23 5 3.80	5.59	5 52 49.7	38.4	9.279	58.03	11 35.48	16 9.25	1 5.13	22 53 28.22
6	23 8 46.30	48.05	5 29 34.6	23.5	9.262	58.22	11 21.42	16 9.00	1 5.07	22 57 24.77
7	23 12 28.39	30.10	− 5 6 15.1	4.2	9.246	+58.39	+11 6.95	16 8.75	1 5.01	23 1 21.32
8	23 16 10.08	11.75	4 42 51.6	40.9	9.230	58.55	10 52.09	16 8.50	1 4.95	23 5 17.88
9	23 19 51.39	53.02	4 19 24.5	14.1	9.214	58.70	10 36.85	16 8.24	1 4.90	23 9 14.43
10	23 23 32.34	33.93	3 55 54.2	44.0	9.200	58.82	10 21.25	16 7.99	1 4.85	23 13 10.98
11	23 27 12.95	14.50	3 32 21.1	11.1	9.185	58.93	10 5.31	16 7.73	1 4.81	23 17 7.53
12	23 30 53.23	54.74	− 3 8 45.6	35.8	9.172	+59.02	+ 9 49.04	16 7.47	1 4.76	23 21 4.08
13	23 34 33.21	34.67	2 44 68.1	58.5	9.160	59.09	9 32.47	16 7.21	1 4.72	23 25 0.63
14	23 38 12.90	14.32	2 21 28.9	19.6	9.149	59.15	9 15.61	16 6.95	1 4.68	23 28 57.19
15	23 41 52.33	53.70	1 57 48.4	39.4	9.138	59.20	8 58.48	16 6.68	1 4.64	23 32 53.74
16	23 45 31.51	32.84	1 33 67.0	58.4	9.128	59.23	8 41.11	16 6.42	1 4.61	23 36 50.29
17	23 49 10.48	11.76	− 1 10 25.0	16.7	9.119	+59.25	+ 8 23.53	16 6.15	1 4.58	23 40 46.84
18	23 52 49.26	50.50	0 46 42.8	34.8	9.112	59.25	8 5.76	16 5.88	1 4.56	23 44 43.39
19	23 56 27.86	29.05	− 0 22 60.7	53.0	9.105	59.25	7 47.82	16 5.61	1 4.54	23 48 39.94
20	0 0 6.32	7.46	+ 0 0 40.9	48.3	9.100	59.22	7 29.73	16 5.34	1 4.52	23 52 36.50
21	0 3 44.66	45.75	0 24 21.7	28.8	9.095	59.18	7 11.53	16 5.06	1 4.51	23 56 33.05
22	0 7 22.90	23.95	+ 0 48 1.3	8.1	9.092	+59.13	+ 6 53.22	16 4.78	1 4.50	0 0 29.60
23	0 11 1.07	2.07	1 11 39.5	46.0	9.090	59.05	6 34.84	16 4.50	1 4.49	0 4 26.15
24	0 14 39.19	40.15	1 35 15.8	22.0	9.088	58.97	6 16.41	16 4.22	1 4.48	0 8 22.70
25	0 18 17.28	18.19	1 58 50.0	55.8	9.087	58.87	5 57.95	16 3.95	1 4.47	0 12 19.25
26	0 21 55.36	56.22	2 22 21.6	27.1	9.087	58.75	5 39.48	16 3.67	1 4.46	0 16 15.81
27	0 25 33.47	34.28	+ 2 45 50.3	55.5	9.088	+58.63	+ 5 21.04	16 3.39	1 4.46	0 20 12.36
28	0 29 11.61	12.37	3 9 15.8	20.7	9.090	58.49	5 2.64	16 3.11	1 4.46	0 24 8.91
29	0 32 49.81	50.52	3 32 37.7	42.3	9.093	58.33	4 44.29	16 2.82	1 4.47	0 28 5.46
30	0 36 28.08	28.75	3 55 55.7	60.0	9.097	58.16	4 26.01	16 2.54	1 4.48	0 32 2.01
31	0 40 6.44	7.07	4 19 9.4	13.4	9.101	57.98	4 7.82	16 2.26	1 4.49	0 35 58.56
32	0 43 44.91	45.49	+ 4 42 18.5	22.2	9.106	+57.78	+ 3 49.74	16 1.98	1 4.51	0 39 55.12
33	0 47 23.51	24.04	+ 5 5 22.6	26.0	9.111	+57.56	+ 3 31.79	16 1.70	1 4.53	0 43 51.67

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0ˢ.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.		Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
		Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
		h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Apr.	1	0 43 44.91	45.49	+ 4 42 18.5	22.2	9.106	+57.78	+3 49.74	16 1.98	1 4.51	0 39 55.12
	2	0 47 23.51	24.04	5 5 22.6	26.0	9.111	57.56	3 31.79	16 1.70	1 4.53	0 43 51.67
	3	0 51 2.24	2.73	5 28 21.3	24.4	9.117	57.33	3 13.98	16 1.42	1 4.55	0 47 48.22
	4	0 54 41.13	41.58	5 51 14.3	17.1	9.124	57.07	2 56.31	16 1.14	1 4.58	0 51 44.77
	5	0 58 20.19	20.60	6 14 1.2	3.7	9.132	56.81	2 38.82	16 0.86	1 4.61	0 55 41.33
	6	1 1 59.44	59.80	+ 6 36 41.6	43.8	9.140	+56.54	+2 21.52	16 0.59	1 4.64	0 59 37.88
	7	1 5 38.88	39.19	6 59 15.2	17.1	9.148	56.24	2 4.43	16 0.32	1 4.67	1 3 34.43
	8	1 9 18.54	18.81	7 21 41.7	43.3	9.157	55.94	1 47.55	16 0.05	1 4.71	1 7 30.98
	9	1 12 58.43	58.66	7 44 0.6	2.0	9.167	55.62	1 30.88	15 59.78	1 4.74	1 11 27.54
	10	1 16 38.56	38.75	8 6 11.7	12.8	9.177	55.29	1 14.46	15 59.52	1 4.78	1 15 24.09
	11	1 20 18.95	19.10	+ 8 28 14.5	15.3	9.189	+54.94	+0 58.31	15 59.25	1 4.82	1 19 20.64
	12	1 23 59.62	59.73	8 50 8.8	9.4	9.201	54.58	0 42.43	15 58.99	1 4.87	1 23 17.19
	13	1 27 40.58	40.65	9 11 54.2	54.6	9.214	54.21	0 26.83	15 58.73	1 4.91	1 27 13.75
	14	1 31 21.85	21.88	9 33 30.4	30.6	9.227	53.81	+0 11.55	15 58.47	1 4.96	1 31 10.30
	15	1 35 3.45	3.44	9 54 57.1	57.1	9.241	53.40	−0 3.40	15 58.20	1 5.01	1 35 6.85
	16	1 38 45.40	45.35	+10 16 13.8	13.6	9.255	+52.99	−0 18.00	15 57.94	1 5.07	1 39 3.40
	17	1 42 27.72	27.63	10 37 20.3	19.9	9.271	52.55	0 32.23	15 57.68	1 5.12	1 42 59.96
	18	1 46 10.42	10.29	10 58 16.3	15.7	9.288	52.10	0 46.08	15 57.42	1 5.18	1 46 56.51
	19	1 49 53.53	53.36	11 19 1.5	0.7	9.305	51.64	0 59.53	15 57.16	1 5.24	1 50 53.07
	20	1 53 37.05	36.85	11 39 35.6	34.6	9.323	51.18	1 12.56	15 56.90	1 5.30	1 54 49.62
	21	1 57 21.01	20.78	+11 59 58.2	57.0	9.341	+50.70	−1 25.15	15 56.64	1 5.36	1 58 46.17
	22	2 1 5.43	5.17	12 20 9.0	7.6	9.360	50.20	1 37.29	15 56.38	1 5.43	2 2 42.72
	23	2 4 50.31	50.02	12 40 7.7	6.2	9.380	49.69	1 48.96	15 56.12	1 5.50	2 6 39.28
	24	2 8 35.67	35.35	12 59 54.1	52.5	9.401	49.17	2 0.15	15 55.86	1 5.57	2 10 35.83
	25	2 12 21.53	21.19	13 19 27.7	26.0	9.422	48.64	2 10.83	15 55.61	1 5.64	2 14 32.38
	26	2 16 7.91	7.54	+13 38 48.2	46.4	9.443	+48.08	−2 21.01	15 55.36	1 5.71	2 18 28.93
	27	2 19 54.80	54.41	13 57 55.4	53.4	9.465	47.52	2 31.68	15 55.11	1 5.78	2 22 25.49
	28	2 23 42.21	41.80	14 16 48.9	46.8	9.487	46.94	2 39.82	15 54.86	1 5.86	2 26 22.04
	29	2 27 30.16	29.72	14 35 28.4	26.2	9.509	46.35	2 48.43	15 54.61	1 5.93	2 30 18.60
	30	2 31 18.64	18.18	14 53 53.5	51.3	9.532	45.74	2 56.49	15 54.37	1 6.01	2 34 15.16
May	1	2 35 7.67	7.19	+15 12 4.0	1.7	9.554	+45.13	−3 4.02	15 54.13	1 6.09	2 38 11.71
	2	2 38 57.24	56.74	15 29 59.5	57.2	9.577	44.50	3 11.00	15 53.89	1 6.17	2 42 8.26
	3	2 42 47.37	46.85	15 47 39.7	37.3	9.600	43.85	3 17.43	15 53.66	1 6.25	2 46 4.81
	4	2 46 38.05	37.51	16 5 4.3	1.8	9.623	43.19	3 23.30	15 53.43	1 6.33	2 50 1.36
	5	2 50 29.29	28.73	16 22 12.8	10.3	9.646	42.52	3 28.62	15 53.21	1 6.41	2 53 57.92
	6	2 54 21.08	20.50	+16 39 5.0	2.5	9.670	+41.83	−3 33.38	15 52.99	1 6.49	2 57 54.47
	7	2 58 13.42	12.83	16 55 40.6	38.1	9.693	41.13	3 37.59	15 52.77	1 6.57	3 1 51.03
	8	3 2 6.32	5.72	17 11 59.3	56.8	9.716	40.42	3 41.25	15 52.56	1 6.66	3 5 47.58
	9	3 5 59.78	59.17	17 27 60.8	58.3	9.739	39.70	3 44.35	15 52.35	1 6.74	3 9 44.14
	10	3 9 53.79	53.17	17 43 44.7	42.2	9.762	38.96	3 46.89	15 52.14	1 6.82	3 13 40.69
	11	3 13 48.36	47.73	+17 59 10.8	8.3	9.785	+38.21	−3 48.88	15 51.94	1 6.90	3 17 37.25
	12	3 17 43.48	42.85	18 14 18.7	16.3	9.808	37.45	3 50.32	15 51.74	1 6.99	3 21 33.80
	13	3 21 39.16	38.53	18 29 8.2	5.8	9.831	36.67	3 51.20	15 51.54	1 7.07	3 25 30.36
	14	3 25 35.40	34.76	18 43 39.0	36.7	9.855	35.88	3 51.52	15 51.35	1 7.15	3 29 26.91
	15	3 29 32.19	31.55	18 57 50.8	48.6	9.878	35.08	3 51.27	15 51.15	1 7.23	3 33 23.47
	16	3 33 29.54	28.90	+19 11 43.4	41.2	9.902	+34.28	−3 50.47	15 50.96	1 7.32	3 37 20.02
	17	3 37 27.45	26.81	+19 25 16.5	14.3	9.925	+33.46	−3 49.12	15 50.77	1 7.40	3 41 16.58

Note.—For mean time interval of semidiameter passing meridian, subtract $0^s.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
May 17	3 37 27.45	26.81	+19 25 16.5	14.3	9.925	+33.46	−3 49.12	15 50.77	1 7.40	3 41 16.58
18	3 41 25.91	25.28	19 38 29.8	27.7	9.948	32.63	3 47.21	15 50.58	1 7.48	3 45 13.13
19	3 45 24.94	24.31	19 51 23.1	21.1	9.971	31.79	3 44.75	15 50.39	1 7.56	3 49 9.69
20	3 49 24.52	23.90	20 3 56.1	54.2	9.994	30.95	3 41.73	15 50.21	1 7.63	3 53 6.24
21	3 53 24.65	24.04	20 16 8.6	6.7	10.017	30.09	3 38.16	15 50.03	1 7.71	3 57 2.80
22	3 57 25.32	24.72	+20 27 60.4	58.6	10.039	+29.23	−3 34.05	15 49.85	1 7.78	4 0 59.35
23	4 1 26.53	25.94	20 39 31.3	29.6	10.062	28.36	3 29.39	15 49.67	1 7.85	4 4 55.91
24	4 5 28.28	27.70	20 50 40.9	39.3	10.084	27.46	3 24.19	15 49.50	1 7.92	4 8 52.47
25	4 9 30.55	29.98	21 1 29.0	27.5	10.105	26.56	3 18.48	15 49.34	1 8.00	4 12 49.03
26	4 13 33.33	32.78	21 11 55.5	54.1	10.126	25.65	3 12.25	15 49.18	1 8.06	4 16 45.58
27	4 17 36.62	36.09	+21 21 60.1	58.8	10.147	+24.74	−3 5.53	15 49.02	1 8.13	4 20 42.14
28	4 21 40.40	39.90	21 31 42.7	41.5	10.167	23.82	2 58.31	15 48.86	1 8.19	4 24 38.69
29	4 25 44.64	44.15	21 41 3.0	1.9	10.186	22.88	2 50.62	15 48.71	1 8.25	4 28 35.25
30	4 29 49.34	48.87	21 49 60.8	59.8	10.205	21.94	2 42.47	15 48.56	1 8.31	4 32 31.80
31	4 33 54.48	54.04	21 58 35.8	34.9	10.223	20.99	2 33.89	15 48.41	1 8.37	4 36 28.36
June 1	4 37 60.04	59.63	+22 6 47.9	47.1	10.239	+20.03	−2 24.88	15 48.27	1 8.43	4 40 24.92
2	4 42 5.99	5.61	22 14 37.0	36.3	10.255	19.06	2 15.49	15 48.14	1 8.48	4 44 21.48
3	4 46 12.32	11.97	22 22 2.9	2.3	10.271	18.09	2 5.73	15 48.01	1 8.54	4 48 18.03
4	4 50 19.00	18.68	22 29 5.3	4.7	10.285	17.11	1 55.60	15 47.89	1 8.59	4 52 14.59
5	4 54 26.02	25.73	22 35 44.1	43.6	10.299	16.12	1 45.13	15 47.78	1 8.64	4 56 11.14
6	4 58 33.35	33.09	+22 41 59.2	58.8	10.312	+15.13	−1 34.36	15 47.67	1 8.69	5 0 7.70
7	5 2 40.97	40.74	22 47 50.4	50.1	10.323	14.14	1 23.30	15 47.56	1 8.73	5 4 4.26
8	5 6 48.85	48.65	22 53 17.6	17.4	10.334	13.14	1 11.97	15 47.46	1 8.77	5 8 0.82
9	5 10 56.97	56.80	22 58 20.7	20.5	10.344	12.13	1 0.40	15 47.36	1 8.80	5 11 57.37
10	5 15 5.32	5.18	23 2 59.5	59.4	10.353	11.12	0 48.61	15 47.27	1 8.83	5 15 53.93
11	5 19 13.87	13.77	+23 7 14.0	13.9	10.360	+10.10	−0 36.62	15 47.18	1 8.86	5 19 50.48
12	5 23 22.61	22.54	23 11 4.0	4.0	10.367	9.08	0 24.44	15 47.09	1 8.88	5 23 47.04
13	5 27 31.50	31.47	23 14 29.5	29.5	10.373	8.06	−0 12.10	15 47.01	1 8.90	5 27 43.60
14	5 31 40.55	40.55	23 17 30.4	30.4	10.379	7.03	+0 0.38	15 46.93	1 8.92	5 31 40.16
15	5 35 49.71	49.75	23 20 6.7	6.7	10.384	6.00	0 13.00	15 46.86	1 8.93	5 35 36.71
16	5 39 58.98	59.05	+23 22 18.3	18.3	10.388	+ 4.97	+0 25.73	15 46.79	1 8.95	5 39 33.27
17	5 44 8.34	8.44	23 24 5.1	5.1	10.391	3.94	0 38.54	15 46.72	1 8.96	5 43 29.82
18	5 48 17.76	17.90	23 25 27.2	27.2	10.393	2.91	0 51.40	15 46.65	1 8.97	5 47 26.38
19	5 52 27.23	27.41	23 26 24.5	24.5	10.395	1.87	1 4.31	15 46.59	1 8.98	5 51 22.94
20	5 56 36.72	36.94	23 26 57.0	57.0	10.396	+ 0.84	1 17.24	15 46.53	1 8.98	5 55 19.50
21	6 0 46.23	46.49	+23 27 4.7	4.7	10.396	− 0.20	+1 30.19	15 46.47	1 8.98	5 59 16.05
22	6 4 55.72	56.02	23 26 47.6	47.5	10.395	1.23	1 43.13	15 46.42	1 8.98	6 3 12.61
23	6 9 5.17	5.51	23 26 5.6	5.5	10.393	2.26	1 56.02	15 46.37	1 8.97	6 7 9.17
24	6 13 14.57	14.95	23 24 58.9	58.8	10.390	3.29	2 8.85	15 46.32	1 8.96	6 11 5.73
25	6 17 23.89	24.30	23 23 27.6	27.4	10.386	4.32	2 21.62	15 46.28	1 8.94	6 15 2.28
26	6 21 33.10	33.55	+23 21 31.6	31.4	10.381	− 5.34	+2 34.28	15 46.24	1 8.92	6 18 58.84
27	6 25 42.17	42.66	23 19 11.0	10.7	10.376	6.36	2 46.80	15 46.21	1 8.89	6 22 55.39
28	6 29 51.09	51.61	23 16 25.7	25.4	10.369	7.38	2 59.16	15 46.19	1 8.86	6 26 51.95
29	6 33 59.83	60.38	23 13 16.0	15.6	10.360	8.40	3 11.35	15 46.17	1 8.83	6 30 48.51
30	6 38 8.36	8.95	23 9 41.9	41.4	10.351	9.42	3 23.33	15 46.16	1 8.80	6 34 45.07
31	6 42 16.66	17.28	+23 5 43.5	42.9	10.340	−10.43	+3 35.07	15 46.15	1 8.77	6 38 41.62
32	6 46 24.70	25.35	+23 1 20.8	20.1	10.328	−11.44	+3 46.55	15 46.14	1 8.73	6 42 38.18

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.19$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
July 1	6 42 16.66	17.28	+23 5 43.5	42.9	10.340	−10.43	+3 35.07	15 46.15	1 8.77	6 38 41.62
2	6 46 24.70	25.35	23 1 20.8	20.1	10.328	11.44	3 46.55	15 46.14	1 8.73	6 42 38.18
3	6 50 32.45	33.13	22 56 34.1	33.3	10.316	12.44	3 57.74	15 46.14	1 8.69	6 46 34.73
4	6 54 39.89	40.60	22 51 23.4	22.5	10.303	13.44	4 8.62	15 46.15	1 8.65	6 50 31.29
5	6 58 47.00	47.74	22 45 48.8	47.8	10.289	14.43	4 19.18	15 46.16	1 8.61	6 54 27.85
6	7 2 53.75	54.52	+22 39 50.5	49.4	10.274	−15.42	+4 29.38	15 46.18	1 8.56	6 58 24.41
7	7 7 0.12	0.92	22 33 28.7	27.4	10.257	16.39	4 39.20	15 46.21	1 8.51	7 2 20.96
8	7 11 6.09	6.91	22 26 43.4	42.0	10.240	17.36	4 48.61	15 46.24	1 8.46	7 6 17.52
9	7 15 11.64	12.48	22 19 34.9	33.4	10.222	18.33	4 57.59	15 46.27	1 8.40	7 10 14.08
10	7 19 16.76	17.62	22 12 3.3	1.7	10.204	19.29	5 6.15	15 46.31	1 8.34	7 14 10.64
11	7 23 21.43	22.31	+22 4 8.8	7.1	10.185	−20.24	+5 14.27	15 46.35	1 8.28	7 18 7.19
12	7 27 25.64	26.54	21 55 51.6	49.7	10.165	21.18	5 21.92	15 46.39	1 8.22	7 22 3.75
13	7 31 29.37	30.29	21 47 11.8	9.7	10.145	22.11	5 29.09	15 46.44	1 8.15	7 26 0.31
14	7 35 32.61	33.55	21 38 9.6	7.4	10.125	23.04	5 35.77	15 46.49	1 8.08	7 29 56.87
15	7 39 35.35	36.31	21 28 45.3	43.0	10.104	23.96	5 41.95	15 46.55	1 8.01	7 33 53.42
16	7 43 37.59	38.56	+21 18 59.1	56.7	10.082	−24.87	+5 47.63	15 46.61	1 7.94	7 37 49.98
17	7 47 39.31	40.29	21 8 51.2	48.6	10.060	25.77	5 52.80	15 46.67	1 7.86	7 41 46.53
18	7 51 40.51	41.50	20 58 21.7	19.0	10.038	26.66	5 57.44	15 46.73	1 7.78	7 45 43.09
19	7 55 41.18	42.18	20 47 30.9	28.1	10.016	27.54	6 1.55	15 46.80	1 7.70	7 49 39.64
20	7 59 41.31	42.32	20 36 19.1	16.2	9.994	28.41	6 5.13	15 46.88	1 7.62	7 53 36.20
21	8 3 40.91	41.93	+20 24 46.5	43.5	9.971	−29.28	+6 8.17	15 46.96	1 7.54	7 57 32.75
22	8 7 39.96	40.99	20 12 53.3	50.2	9.948	30.13	6 10.66	15 47.04	1 7.46	8 1 29.31
23	8 11 38.45	39.48	20 0 39.7	36.5	9.925	30.98	6 12.60	15 47.12	1 7.38	8 5 25.86
24	8 15 36.38	37.41	19 48 6.1	2.8	9.902	31.81	6 13.98	15 47.21	1 7.30	8 9 22.42
25	8 19 33.75	34.78	19 35 12.6	9.2	9.879	32.63	6 14.79	15 47.30	1 7.21	8 13 18.97
26	8 23 30.55	31.58	+19 21 59.6	56.1	9.855	−33.44	+6 15.02	15 47.39	1 7.13	8 17 15.53
27	8 27 26.76	27.78	19 8 27.3	23.7	9.831	34.23	6 14.68	15 47.49	1 7.04	8 21 12.08
28	8 31 22.39	23.40	18 54 36.0	32.3	9.806	35.02	6 13.75	15 47.60	1 6.96	8 25 8.64
29	8 35 17.43	18.44	18 40 25.9	22.2	9.781	35.80	6 12.24	15 47.71	1 6.87	8 29 5.19
30	8 39 11.87	12.87	18 25 57.4	53.6	9.756	36.57	6 10.12	15 47.83	1 6.79	8 33 1.75
31	8 43 5.71	6.70	+18 11 10.8	7.0	9.731	−37.31	+6 7.39	15 47.95	1 6.70	8 36 58.31
Aug. 1	8 46 58.94	59.92	17 56 6.3	2.4	9.706	38.05	6 4.06	15 48.08	1 6.62	8 40 54.86
2	8 50 51.56	52.53	17 40 44.3	40.4	9.680	38.78	6 0.13	15 48.21	1 6.53	8 44 51.41
3	8 54 43.57	44.52	17 25 5.0	1.1	9.655	39.49	5 55.58	15 48.35	1 6.44	8 48 47.97
4	8 58 34.96	35.90	17 9 8.8	4.9	9.629	40.18	5 50.41	15 48.49	1 6.35	8 52 44.52
5	9 2 25.73	26.65	+16 52 55.9	52.0	9.604	−40.87	+5 44.63	15 48.64	1 6.26	8 56 41.08
6	9 6 15.89	16.79	16 36 26.6	22.7	9.578	41.55	5 38.24	15 48.79	1 6.18	9 0 37.63
7	9 10 5.45	6.33	16 19 41.3	37.4	9.553	42.22	5 31.24	15 48.94	1 6.09	9 4 34.19
8	9 13 54.40	55.26	16 2 40.3	36.5	9.528	42.86	5 23.63	15 49.10	1 6.01	9 8 30.74
9	9 17 42.75	43.59	15 45 23.8	20.0	9.503	43.50	5 15.42	15 49.26	1 5.92	9 12 27.30
10	9 21 30.50	31.31	+15 27 52.2	48.5	9.478	−44.12	+5 6.62	15 49.43	1 5.84	9 16 23.85
11	9 25 17.67	18.45	15 10 5.8	2.1	9.454	44.74	4 57.24	15 49.60	1 5.76	9 20 20.41
12	9 29 4.27	5.02	14 52 4.9	1.3	9.430	45.33	4 47.28	15 49.77	1 5.68	9 24 16.96
13	9 32 50.31	51.03	14 33 49.7	46.2	9.407	45.92	4 36.76	15 49.94	1 5.60	9 28 13.52
14	9 36 35.79	36.48	14 15 20.6	17.2	9.384	46.50	4 25.69	15 50.12	1 5.52	9 32 10.07
15	9 40 20.74	21.40	+13 56 37.9	34.6	9.362	−47.05	+4 14.08	15 50.30	1 5.44	9 36 6.63
16	9 44 5.17	5.80	+13 37 41.9	38.7	9.341	−47.60	+4 1.96	15 50.48	1 5.37	9 40 3.18

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0s.19 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Aug. 16	9 44 5.17	5.80	+13 37 41.9	38.7	9.341	−47.60	+ 4 1.96	15 50.48	1 5.37	9 40 3.18
17	9 47 49.09	49.69	13 18 32.8	29.7	9.320	48.14	3 49.33	15 50.66	1 5.29	9 43 59.73
18	9 51 32.51	33.07	12 59 11.0	8.0	9.299	48.67	3 36.20	15 50.85	1 5.22	9 47 56.28
19	9 55 15.45	15.97	12 39 36.8	33.9	9.279	49.17	3 22.59	15 51.04	1 5.14	9 51 52.84
20	9 58 57.93	58.41	12 19 50.5	47.8	9.261	49.67	3 8.51	15 51.22	1 5.07	9 55 49.39
21	10 2 39.96	40.41	+11 59 52.4	49.9	9.242	−50.16	+ 2 53.98	15 51.41	1 5.00	9 59 45.95
22	10 6 21.55	21.96	11 39 42.8	40.5	9.224	50.63	2 39.02	15 51.61	1 4.94	10 3 42.50
23	10 10 2.71	3.08	11 19 22.0	19.9	9.206	51.08	2 23.63	15 51.81	1 4.88	10 7 39.05
24	10 13 43.46	43.79	10 58 50.4	48.5	9.190	51.53	2 7.83	15 52.01	1 4.82	10 11 35.60
25	10 17 23.81	24.10	10 38 8.3	6.6	9.174	51.97	1 51.63	15 52.21	1 4.76	10 15 32.16
26	10 21 3.77	4.02	+10 17 15.9	14.4	9.158	−52.39	+ 1 35.04	15 52.42	1 4.70	10 19 28.71
27	10 24 43.36	43.56	9 56 13.7	12.4	9.142	52.79	1 18.08	15 52.64	1 4.64	10 23 25.26
28	10 28 22.58	22.73	9 35 2.0	1.0	9.127	53.18	1 0.75	15 52.86	1 4.59	10 27 21.81
29	10 32 1.45	1.55	9 13 41.1	40.3	9.112	53.56	0 43.08	15 53.08	1 4.54	10 31 18.37
30	10 35 39.98	40.04	8 52 11.3	10.8	9.099	53.91	0 25.07	15 53.31	1 4.49	10 35 14.92
31	10 39 18.18	18.20	+ 8 30 32.9	32.7	9.085	−54.26	+ 0 6.72	15 53.54	1 4.44	10 39 11.47
Sept. 1	10 42 56.07	56.04	8 8 46.4	46.4	9.072	54.60	− 0 11.95	15 53.77	1 4.40	10 43 8.02
2	10 46 33.66	33.59	7 46 52.0	52.3	9.060	54.93	0 30.92	15 54.01	1 4.36	10 47 4.58
3	10 50 10.95	10.83	7 24 50.1	50.8	9.049	55.23	0 50.17	15 54.25	1 4.32	10 51 1.13
4	10 53 47.98	47.81	7 2 41.0	42.1	9.038	55.52	1 9.69	15 54.49	1 4.28	10 54 57.68
5	10 57 24.75	24.53	+ 6 40 25.2	26.6	9.027	−55.80	− 1 29.47	15 54.73	1 4.24	10 58 54.23
6	11 1 1.28	1.01	6 18 2.8	4.5	9.017	56.06	1 49.48	15 54.98	1 4.21	11 2 50.79
7	11 4 37.59	37.27	5 55 34.2	36.2	9.008	56.31	2 9.72	15 55.23	1 4.18	11 6 47.34
8	11 8 13.71	13.33	5 32 59.8	62.1	9.001	56.55	2 30.15	15 55.48	1 4.16	11 10 43.89
9	11 11 49.64	49.22	5 10 19.8	22.5	8.994	56.77	2 50.76	15 55.73	1 4.14	11 14 40.44
10	11 15 25.41	24.94	+ 4 47 34.6	37.6	8.988	−56.98	− 3 11.54	15 55.99	1 4.12	11 18 37.00
11	11 19 1.05	0.53	4 24 44.5	47.9	8.982	57.18	3 32.45	15 56.25	1 4.11	11 22 33.55
12	11 22 36.58	36.00	4 1 49.9	53.6	8.977	57.37	3 53.47	15 56.51	1 4.09	11 26 30.10
13	11 26 12.01	11.38	3 38 51.0	55.1	8.975	57.53	4 14.58	15 56.77	1 4.08	11 30 26.65
14	11 29 47.37	46.69	3 15 48.1	52.6	8.973	57.69	4 35.76	15 57.02	1 4.07	11 34 23.20
15	11 33 22.70	21.97	+ 2 52 41.6	46.4	8.972	−57.84	− 4 56.99	15 57.28	1 4.07	11 38 19.75
16	11 36 58.01	57.23	2 29 31.8	36.9	8.972	57.97	5 18.23	15 57.54	1 4.06	11 42 16.31
17	11 40 33.31	32.47	2 6 19.0	24.5	8.972	58.08	5 39.47	15 57.80	1 4.06	11 46 12.86
18	11 44 8.65	7.76	1 43 3.5	9.3	8.973	58.19	6 0.68	15 58.06	1 4.06	11 50 9.41
19	11 47 44.03	43.09	1 19 45.6	51.8	8.976	58.29	6 21.84	15 58.32	1 4.06	11 54 5.96
20	11 51 19.48	18.49	+ 0 56 25.7	32.2	8.979	−58.36	− 6 42.94	15 58.58	1 4.07	11 58 2.51
21	11 54 55.02	53.97	0 33 4.1	11.0	8.983	58.43	7 3.95	15 58.84	1 4.08	12 1 59.06
22	11 58 30.67	29.57	+ 0 9 41.2	48.4	8.988	58.48	7 24.85	15 59.10	1 4.09	12 5 55.62
23	12 2 6.45	5.29	− 0 13 42.8	35.2	8.994	58.51	7 45.61	15 59.37	1 4.11	12 9 52.17
24	12 5 42.38	41.17	0 36 67.5	59.6	9.000	58.53	8 6.23	15 59.63	1 4.14	12 13 48.72
25	12 9 18.48	17.21	− 1 0 32.5	24.2	9.008	−58.54	− 8 26.68	15 59.90	1 4.17	12 17 45.27
26	12 12 54.76	53.44	1 23 57.4	48.8	9.016	58.53	8 46.95	16 0.17	1 4.20	12 21 41.83
27	12 16 31.24	29.86	1 47 21.9	12.9	9.025	58.50	9 7.02	16 0.44	1 4.23	12 25 38.38
28	12 20 7.94	6.51	2 10 45.7	36.4	9.034	58.46	9 26.86	16 0.71	1 4.26	12 29 34.93
29	12 23 44.88	43.40	2 33 68.3	58.7	9.044	58.41	9 46.47	16 0.99	1 4.30	12 33 31.48
30	12 27 22.07	20.54	− 2 57 29.4	19.5	9.055	−58.33	−10 5.83	16 1.27	1 4.34	12 37 28.03
31	12 30 59.52	57.94	− 3 20 48.6	38.4	9.067	−58.25	−10 24.93	16 1.55	1 4.38	12 41 24.58

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Oct. 1	12 30 59.52	57.94	− 3 20 48.6	38.4	9.067	−58.25	−10 24.93	16 1.55	1 4.38	12 41 24.58
2	12 34 37.25	35.62	3 43 65.6	55.2	9.079	58.15	10 43.75	16 1.83	1 4.42	12 45 21.14
3	12 38 15.29	13.62	4 7 20.0	9.4	9.092	58.03	11 2.26	16 2.12	1 4.47	12 49 17.69
4	12 41 53.65	51.93	4 30 31.3	20.4	9.106	57.90	11 20.45	16 2.41	1 4.52	12 53 14.24
5	12 45 32.35	30.58	4 53 39.3	28.2	9.120	57.76	11 38.30	16 2.69	1 4.57	12 57 10.79
6	12 49 11.41	9.59	− 5 16 43.6	32.2	9.135	−57.60	−11 55.80	16 2.97	1 4.63	13 1 7.35
7	12 52 50.85	48.98	5 39 43.7	32.1	9.152	57.43	12 12.91	16 3.25	1 4.69	13 5 3.90
8	12 56 30.69	28.77	6 2 39.4	27.5	9.169	57.23	12 29.62	16 3.53	1 4.75	13 9 0.45
9	13 0 10.96	9.00	6 25 30.3	18.2	9.187	57.01	12 45.91	16 3.81	1 4.82	13 12 57.00
10	13 3 51.67	49.66	6 48 16.0	3.7	9.206	56.79	13 1.75	16 4.09	1 4.89	13 16 53.55
11	13 7 32.84	30.79	− 7 10 56.1	43.6	9.226	−56.55	−13 17.12	16 4.37	1 4.96	13 20 50.10
12	13 11 14.50	12.41	7 33 30.3	17.6	9.248	56.29	13 32.02	16 4.65	1 5.04	13 24 46.66
13	13 14 56.68	54.55	7 55 58.3	45.5	9.270	56.03	13 46.40	16 4.92	1 5.12	13 28 43.21
14	13 18 39.39	37.22	8 18 19.7	6.7	9.292	55.75	14 0.24	16 5.20	1 5.20	13 32 39.76
15	13 22 22.65	20.44	8 40 34.1	21.0	9.315	55.45	14 13.53	16 5.47	1 5.28	13 36 36.31
16	13 26 6.50	4.25	− 9 2 41.1	27.9	9.339	−55.14	−14 26.24	16 5.74	1 5.36	13 40 32.87
17	13 29 50.94	48.65	9 24 40.4	27.1	9.365	54.81	14 38.36	16 6.01	1 5.45	13 44 29.42
18	13 33 36.00	33.67	9 46 31.6	18.2	9.391	54.45	14 49.86	16 6.28	1 5.54	13 48 25.98
19	13 37 21.70	19.33	10 8 14.3	0.8	9.418	54.09	15 0.72	16 6.54	1 5.63	13 52 22.53
20	13 41 8.05	5.65	10 29 48.2	34.6	9.445	53.72	15 10.93	16 6.80	1 5.72	13 56 19.08
21	13 44 55.07	52.64	−10 50 72.9	59.3	9.473	−53.33	−15 20.47	16 7.06	1 5.82	14 0 15.63
22	13 48 42.77	40.31	11 12 27.9	14.2	9.502	52.92	15 29.33	16 7.32	1 5.92	14 4 12.19
23	13 52 31.17	28.68	11 33 32.9	19.2	9.531	52.50	15 37.48	16 7.58	1 6.02	14 8 8.74
24	13 56 20.28	17.77	11 54 27.5	13.8	9.561	52.05	15 44.92	16 7.84	1 6.12	14 12 5.29
25	14 0 10.12	7.59	12 14 71.2	57.6	9.592	51.59	15 51.65	16 8.10	1 6.22	14 16 1.84
26	14 3 60.69	58.13	−12 35 43.7	30.1	9.623	−51.11	−15 57.65	16 8.36	1 6.32	14 19 58.40
27	14 7 51.99	49.41	12 55 64.5	51.0	9.654	50.61	16 2.91	16 8.62	1 6.43	14 23 54.95
28	14 11 44.05	41.45	13 15 73.2	59.8	9.685	50.10	16 7.41	16 8.87	1 6.54	14 27 51.51
29	14 15 36.87	34.25	13 35 69.4	56.1	9.717	49.58	16 11.15	16 9.12	1 6.65	14 31 48.06
30	14 19 30.45	27.81	13 55 52.6	39.4	9.749	49.02	16 14.12	16 9.38	1 6.76	14 35 44.61
31	14 23 24.80	22.15	−14 15 22.5	9.4	9.781	−48.46	−16 16.34	16 9.63	1 6.87	14 39 41.16
Nov. 1	14 27 19.93	17.27	14 34 38.6	25.6	9.814	47.88	16 17.78	16 9.89	1 6.99	14 43 37.72
2	14 31 15.85	13.18	14 53 40.4	27.6	9.847	47.27	16 18.42	16 10.14	1 7.11	14 47 34.27
3	14 35 12.56	9.88	15 12 27.6	15.0	9.880	46.66	16 18.27	16 10.39	1 7.23	14 51 30.83
4	14 39 10.07	7.38	15 30 59.8	47.3	9.913	46.03	16 17.33	16 10.64	1 7.35	14 55 27.38
5	14 43 8.38	5.68	−15 49 16.6	4.3	9.946	−45.37	−16 15.59	16 10.89	1 7.47	14 59 23.94
6	14 47 7.51	4.81	16 7 17.5	5.4	9.980	44.70	16 13.03	16 11.13	1 7.58	15 3 20.49
7	14 51 7.46	4.76	16 24 62.1	50.2	10.015	44.01	16 9.64	16 11.37	1 7.70	15 7 17.05
8	14 55 8.23	5.53	16 42 30.0	18.4	10.050	43.31	16 5.43	16 11.61	1 7.82	15 11 13.60
9	14 59 9.84	7.14	16 59 40.9	29.5	10.085	42.60	16 0.39	16 11.84	1 7.94	15 15 10.16
10	15 3 12.28	9.59	−17 16 34.4	23.4	10.120	−41.86	−15 54.51	16 12.06	1 8.05	15 19 6.71
11	15 7 15.57	12.89	17 32 70.1	59.4	10.155	41.11	15 47.79	16 12.29	1 8.17	15 23 3.27
12	15 11 19.72	17.05	17 49 27.5	17.1	10.191	40.35	15 40.20	16 12.50	1 8.29	15 26 59.82
13	15 15 24.72	22.06	18 5 26.4	16.3	10.227	39.56	15 31.75	16 12.71	1 8.41	15 30 56.38
14	15 19 30.57	27.93	18 20 66.3	56.5	10.263	38.76	15 22.46	16 12.92	1 8.53	15 34 52.93
15	15 23 37.27	34.65	−18 36 26.9	17.4	10.299	−37.95	−15 12.32	16 13.13	1 8.65	15 38 49.49
16	15 27 44.84	42.24	−18 51 27.7	18.5	10.334	−37.12	−15 1.31	16 13.34	1 8.77	15 42 46.04

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^s.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Nov. 16	15 27 44.84	42.24	−18 51 27.7	18.5	10 334	−37.12	−15 1.31	16 13.34	1 8.77	15 42 46.04
17	15 31 53.27	50.70	19 5 68.4	59.5	10.369	36.27	14 49.45	16 13.54	1 8.88	15 46 42.60
18	15 36 2.54	0.01	19 20 28.7	20.1	10.404	35.41	14 36.75	16 13.73	1 8.99	15 50 39.15
19	15 40 12.65	10.15	19 34 28.2	19.9	10.439	34.54	14 23.20	16 13.92	1 9.11	15 54 35.71
20	15 44 23.60	21.13	19 47 66.4	58.5	10.473	33.64	14 8.81	16 14.11	1 9.22	15 58 32.26
21	15 48 35.38	32.95	−20 1 23.0	15.4	10.507	−32.74	−13 53.59	16 14.30	1 9.33	16 2 28.82
22	15 52 47.98	45.59	20 14 17.7	10.5	10.541	31.82	13 37.56	16 14.48	1 9.44	16 6 25.37
23	15 56 61.37	59.02	20 26 50.1	43.2	10.574	30.88	13 20.72	16 14.66	1 9.55	16 10 21.92
24	16 1 15.55	13.24	20 38 59.8	53.3	10.607	29.93	13 3.09	16 14.84	1 9.65	16 14 18.48
25	16 5 30.50	28.24	20 50 46.5	40.3	10.639	28.97	12 44.69	16 15.02	1 9.76	16 18 15.04
26	16 9 46.20	43.99	−21 2 9.9	4.1	10.669	−27.98	−12 25.54	16 15.19	1 9.86	16 22 11.59
27	16 14 2.62	0.46	21 13 9.6	4.2	10.699	26.99	12 5.68	16 15.36	1 9.96	16 26 8.15
28	16 18 19.75	17.64	21 23 45.2	40.2	10.728	25.98	11 45.12	16 15.52	1 10.06	16 30 4.70
29	16 22 37.57	35.52	21 33 56.4	51.8	10.756	24.95	11 23.87	16 15 68	1 10.16	16 34 1.26
30	16 26 56.05	54.06	21 43 43.0	38.7	10.784	23.92	11 1.95	16 15.84	1 10.25	16 37 57.82
Dec. 1	16 31 15.16	13.23	−21 53 4.6	0.6	10.809	−22.88	−10 39.39	16 16.00	1 10.34	16 41 54.38
2	16 35 34.89	33.02	22 1 61.0	57.3	10.834	21.82	10 16.22	16 16.15	1 10.42	16 45 50.93
3	16 39 55.20	53.41	22 10 31.8	28.4	10.858	20.75	9 52.45	16 16.30	1 10.50	16 49 47.49
4	16 44 16.09	14.37	22 18 36.8	33.7	10.882	19.67	9 28.12	16 16.44	1 10.58	16 53 44.04
5	16 48 37.52	35.87	22 26 15.8	13.0	10.904	18.58	9 3.23	16 16.58	1 10.65	16 57 40.60
6	16 52 59.47	57.89	−22 33 28.5	26.0	10.924	−17.48	− 8 37.84	16 16.71	1 10.72	17 1 37.16
7	16 57 21.91	20.41	22 40 14.7	12.4	10.944	16.37	8 11.96	16 16.84	1 10.79	17 5 33.72
8	17 1 44.82	43.40	22 46 34.1	32.0	10.964	15.25	7 45.59	16 16.96	1 10.85	17 9 30.27
9	17 6 8.18	6.84	22 52 26.7	24.9	10.982	14.13	7 18.79	16 17.08	1 10.91	17 13 26.83
10	17 10 31.95	30.69	22 57 52.2	50.6	10.998	13.00	6 51.57	16 17.19	1 10.97	17 17 23.39
11	17 14 56.12	54.94	−23 2 50.4	49.0	11.014	−11.86	− 6 23.96	16 17.29	1 11.02	17 21 19.95
12	17 19 20.66	19.57	23 7 21.1	19.9	11.029	10.71	5 55.96	16 17.39	1 11.07	17 25 16.50
13	17 23 45.55	44.54	23 11 24.3	23.3	11.043	9.56	5 27.62	16 17.49	1 11.12	17 29 13.06
14	17 28 10.74	9.82	23 14 59.8	59.0	11.055	8.41	4 58.96	16 17.58	1 11.16	17 33 9.61
15	17 32 36.23	35.40	23 18 7.5	6.9	11.066	7.25	4 30.03	16 17.66	1 11.19	17 37 6.17
16	17 37 1.97	1.23	−23 20 47.3	46.8	11.077	− 6.07	− 4 0.84	16 17.73	1 11.21	17 41 2.73
17	17 41 27.94	27.29	23 22 59.0	58.7	11.086	4.90	3 31.42	16 17.80	1 11.23	17 44 59.29
18	17 45 54.10	53.54	23 24 42.7	42.5	11.093	3.73	3 1.80	16 17.87	1 11.25	17 48 55.84
19	17 50 20.42	19.95	23 25 58.2	58.1	11.099	2.56	2 32.02	16 17.93	1 11.27	17 52 52.40
20	17 54 46.86	46.48	23 26 45.5	45.4	11.104	1.38	2 2.13	16 17.99	1 11.28	17 56 48.96
21	17 59 13.39	13.10	−23 27 4.5	4.5	11.106	− 0.20	− 1 32.15	16 18.04	1 11.29	18 0 45.52
22	18 3 39.98	39.78	23 26 55.3	55.3	11.108	+ 0.98	1 2.11	16 18.09	1 11.29	18 4 42.07
23	18 8 6.58	6.48	23 26 17.8	17.8	11.108	2.16	0 32.06	16 18.14	1 11.29	18 8 38.63
24	18 12 33.16	33.15	23 25 12.0	12.0	11.106	3.33	− 0 2.03	16 18.18	1 11.28	18 12 35.19
25	18 16 59.67	59.75	23 23 38.0	38.0	11.103	4.51	+ 0 27.94	16 18.22	1 11.27	18 16 31.75
26	18 21 26.09	26.27	−23 21 35.8	35.7	11.098	+ 5.68	+ 0 57.82	16 18.25	1 11.26	18 20 28.30
27	18 25 52.37	52.64	23 19 5.4	5.2	11.091	6.85	1 27.55	16 18.28	1 11.24	18 24 24.86
28	18 30 18.47	18.83	23 16 6.9	6.6	11.083	8.01	1 57.10	16 18.30	1 11.21	18 28 21.42
29	18 34 44.35	44.80	23 12 40.5	40.1	11.074	9.17	2 26.43	16 18.32	1 11.18	18 32 17.98
30	18 39 9.98	10.52	23 8 46.2	45.7	11.063	10.33	2 55.51	16 18.34	1 11.15	18 36 14.53
31	18 43 35.32	35.95	−23 4 24.0	23.4	11.050	+11.49	+ 3 24.30	16 18.35	1 11.11	18 40 11.09
32	18 48 0.34	1.05	−22 59 34.2	33.4	11.035	+12.65	+ 3 52.78	16 18.36	1 11.07	18 44 7.64

Note.—For mean time interval of semidiameter passing meridian, subtract $0^s.19$ from the sidereal interval.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Jan. 0	21 9.25	2.009	15 53 52.17	130.72	−15 25 45.4	−346.3	64.96	15 6.5	55 20.1	II. S.
1	21 57.63	2.021	16 46 19.42	131.47	−17 19 29.8	−220.6	65.09	14 59.3	54 53.6	II. S.
2	22 46.18	2.021	17 38 56.87	131.49	−18 21 8.7	− 86.9	65.04	14 53.4	54 32.2	II. S.
3	23 34.53	2.004	18 31 22.57	130.46	−18 28 50.1	+ 48 0	64.75	14 49.0	54 15.8	II. S.
5	0 22.26	1.970	19 23 10.37	128.38	−17 43 36.4	176.5	64.21	14 45.8	54 4.2	I. S.
6	1 8.99	1.923	20 13 58.42	125.55	−16 9 14.8	+292.8	63.50	14 44.0	53 57.7	I. S.
7	1 54.54	1.873	21 3 35.58	122.56	−13 51 37.2	392.4	62.76	14 43.9	53 57.1	I. S.
8	2 38.96	1.830	21 52 4.81	119.99	−10 57 50.4	473.3	62.13	14 45.5	54 3.2	I. S.
9	3 22.53	1.804	22 39 42.90	118.38	− 7 35 30.7	535.0	61.78	14 49.3	54 17.1	I. S.
10	4 5.74	1.801	23 26 58.78	118.21	− 3 52 19.4	577.6	61.79	14 55.3	54 39.2	I. S.
11	4 49.21	1.827	0 14 31.03	119.80	+ 0 3 56.0	+600.2	62.27	15 4.0	55 10.9	I. S.
12	5 33.72	1.888	1 3 5.47	123.42	4 4 57.3	600.9	63.26	15 15.1	55 51.9	I. S.
13	6 20.10	1.984	1 53 32.47	129.18	8 1 9.8	575.3	64.77	15 28.7	56 41.7	I. S.
14	7 9.19	2.113	2 46 42.16	136.93	11 40 47.4	516.8	66.72	15 44.2	57 38.6	I. S.
15	8 1.67	2.264	3 43 16.21	146.07	14 49 9.1	417.7	68.94	16 0.7	58 39.3	I. S.
16	8 57.86	2.417	4 43 33.71	155.28	+17 8 50.0	+273.0	71.10	16 16.9	59 38.9	I. S.
17	9 57.44	2.539	5 47 14.52	162.64	18 21 48.2	+ 85.8	72.77	16 31.2	60 31.2	I. S.
18	10 59.25	2.598	6 53 9.77	166.21	18 13 56.7	−127.1	73.54	16 41.6	61 9.4	I. S.
19	12 1.55	2.580	7 59 34.63	165.09	16 40 33.9	−336.4	73.26	16 46.6	61 28.0	I. S.
20	13 2.57	2.496	9 4 42.62	160.07	13 49 26.2	−511.2	72.10	16 45.5	61 23.8	II. S.
21	14 1.09	2.380	10 7 21.12	153.00	+ 9 58 53.9	−631.3	70.47	16 38.6	60 58.3	II. S.
22	14 56.75	2.260	11 7 4.98	145.78	5 32 22.0	−691.5	68.78	16 26.9	60 15.6	II. S.
23	15 49.70	2.158	12 4 7.41	139.69	+ 0 52 52.8	−697.8	67.33	16 12.2	59 21.5	II. S.
24	16 40.55	2.085	12 59 3.33	135.97	− 3 40 8.4	−661.1	66.27	15 56.2	58 22.7	II. S.
25	17 29.99	2.040	13 52 34.15	132.55	− 7 51 39.3	−592.0	65.62	15 40.4	57 24.8	II. S.
26	18 18.64	2.018	14 45 17.65	131.26	−11 30 29.6	−498.9	65.29	15 25.9	56 31.6	II. S.
27	19 6.97	2.012	15 37 42.31	130.90	−14 28 24.6	−388 2	65.17	15 13.4	55 45.6	II. S.
28	19 55.26	2.012	16 30 3.91	130.92	−16 39 24.3	−265.0	65.13	15 3.2	55 7.9	II. S.
29	20 43.53	2.009	17 22 21.86	130.76	−17 59 25.8	−134.2	65.02	14 55.2	54 38.7	II. S.
30	21 31.64	1.997	18 14 35.76	130.03	−18 26 27.1	− 1.0	64.76	14 49.5	54 17.6	II. S.
31	22 19.30	1.972	19 6 19.82	128.52	−18 0 41.2	+128.7	64.31	14 45.7	54 3.9	II. N. S.
Feb. 1	23 6.22	1.936	19 57 19.02	126.32	−16 44 38.9	249.3	63.68	14 43.8	53 56.7	II. N. S.
2	23 52.17	1.893	20 47 20.29	123.76	−14 43 0.2	356.0	62.99	14 43.4	53 55.6	II. S.
4	0 37.10	1.852	21 36 19.93	121.27	−12 2 6.6	445.3	62.33	14 44.6	53 59.7	I. S.
5	1 21.13	1.820	22 24 25.57	119.33	− 8 49 27.2	514.7	61.84	14 47.2	54 9.4	I. S.
6	2 4.57	1.804	23 11 55.72	118.38	− 5 13 8.9	+563.3	61.64	14 51.4	54 24.6	I. S.
7	2 47.89	1.810	23 59 18.46	118.75	− 1 21 38.8	590.5	61.80	14 57.1	54 45.8	I. S.
8	3 31.67	1.843	0 47 9.45	120.76	+ 2 36 16.7	595.2	62.40	15 4.7	55 13.7	I. S.
9	4 16.62	1.907	1 36 9.94	124.58	6 31 16.7	575.5	63.47	15 14.3	55 48.7	I. S.
10	5 3.44	2.009	2 27 3.67	130.19	10 12 56.8	527.9	64.98	15 25.8	56 30.9	I. S.
11	5 52.84	2.120	3 20 32.10	137.40	+13 29 16.2	+447.9	66.83	15 39.0	57 19.4	I. S.
12	6 45.32	2.255	4 17 6.26	145.53	16 6 20.2	330.9	68.84	15 53.6	58 13.0	I. S.
13	7 41.04	2.386	5 16 55.30	153.40	17 48 54.7	+175.6	70.71	16 8.6	59 8.1	I. S.
14	8 39.60	2.486	6 19 34.88	159.46	18 22 30.9	− 19.0	72.09	16 22.7	60 0.0	I. N. S.
15	9 39.97	2.533	7 24 3.72	162.33	+17 37 6.7	−215.6	72.69	16 34.4	60 43.0	I. N. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Feb. 15	9 39.97	2.533	7 24 3.72	162.33	+17 37 6.7	−215.6	72.69	16 34.4	60 43.0	I. N. S.
16	10 40.75	2.520	8 28 56.79	161.50	15 31 12.4	−409.9	72.44	16 42.1	61 11.3	I. N. S.
17	11 40.56	2.457	9 32 51.86	157.70	12 13 58.7	−568.5	71.51	16 44.4	61 19.6	I. N. S.
18	12 38.49	2.368	10 34 53.80	152.34	8 3 47.6	−675.6	70.24	16 40.8	61 6.6	II. S.
19	13 34.21	2.277	11 34 42.97	146.83	+ 3 23 54.9	−716.7	68.94	16 31.8	60 33.5	II. S.
20	14 27.88	2.199	12 32 28.33	142.13	− 1 22 10.8	−705.1	67.82	16 18.5	59 44.7	II. S.
21	15 19.90	2.140	13 28 34.34	139.58	− 5 54 13.2	−648.4	67.01	16 2.7	58 47.0	II. S.
22	16 10.73	2.099	14 23 29.23	136.16	− 9 56 27.7	−558.3	66.47	15 46.3	57 46.3	II. S.
23	17 0.78	2.073	15 17 37.03	134.59	−13 17 43.9	−445.2	66.10	15 30.3	56 47.5	II. S.
24	17 50.30	2.054	16 11 13.09	133.45	−15 50 43.6	−318.0	65.85	15 16.0	55 56.1	II. S.
25	18 39.39	2.036	17 4 22.77	132.33	−17 31 14.7	−183.9	65.54	15 4.2	55 12.9	II. S.
26	19 27.98	2.012	17 57 2.66	130.92	−18 17 38.5	− 48.2	65.16	14 55.5	54 39.8	II. S.
27	20 15.92	1.981	18 49 3.64	129.08	−18 10 23.7	+ 83.4	64.63	14 49.3	54 16.9	II. S.
28	21 3.04	1.945	19 40 15.51	126.86	−17 11 55.7	207.1	63.99	14 45.6	54 3.6	II. N. S.
Mar. 1	21 49.24	1.905	20 30 30.84	124.45	−15 26 18.4	318.6	63.28	14 44.4	53 59.1	II. N.
2	22 34.48	1.867	21 19 50.03	122.17	−12 59 1.7	+414.9	62.62	14 45.2	54 2.1	II. N. S.
3	23 18.91	1.837	22 8 19.42	120.38	− 9 56 46.3	493.1	62.10	14 47.8	54 11.5	II. N. S.
5	0 2.77	1.821	22 56 14.97	119.42	− 6 27 9.2	551.3	61.80	14 51.8	54 26.3	I. S
6	0 46.46	1.823	23 43 59.64	119.52	− 2 38 36.6	587.5	61.85	14 57.1	54 45.6	I. S.
7	1 30.44	1.846	0 32 5.85	120.93	+ 1 19 41.5	599.8	62.26	15 3.4	55 8.8	I. S.
8	2 15.27	1.894	1 20 55.98	123.78	+ 5 17 48.3	+586.3	63.07	15 10.7	55 35.7	I. S.
9	3 1.52	1.965	2 11 15.46	126.08	9 4 54.7	544.4	64.26	15 19.1	56 6.5	I. S.
10	3 49.75	2.058	3 3 33.79	133.64	12 29 13.4	471.8	65.75	15 28.5	56 41.0	I. S.
11	4 40.39	2.164	3 58 16.77	140.03	15 18 0.7	366.5	67.42	15 38.9	57 19.2	I. S.
12	5 33.61	2.271	4 55 35.62	146.48	17 18 3.4	228.3	69.04	15 50.1	58 0.4	I. S.
13	6 29.25	2.362	5 55 19.61	151.93	+18 16 51.6	+ 60.9	70.37	16 1.7	58 42.9	I. N. S.
14	7 26.70	2.419	6 56 52.72	155.42	18 4 44.3	−123.8	71.17	16 12.9	59 24.1	I. N.
15	8 25.04	2.435	7 59 19.35	156.35	16 37 26.3	−311.2	71.35	16 22.8	60 0.5	I. N.
16	9 23.27	2.411	9 1 38.99	154.93	13 58 10.8	−481.3	70.94	16 30.0	60 26.9	I.
17	10 20.58	2.362	10 3 3.52	151.93	10 18 9.9	−612.5	70.16	16 33.5	60 39.8	I.
18	11 16.55	2.303	11 3 7.42	148.38	+ 6 4 15.2	−694.1	69.28	16 32.5	60 36.2	I. N. S.
19	12 11.14	2.248	12 1 47.87	145.08	+ 1 10 15.2	−720.7	68.45	16 26.8	60 15.0	II. N. S.
20	13 4.53	2.204	12 59 17.00	142.48	− 3 34 22.3	−694.2	67.79	16 16.7	59 38.1	II. N. S.
21	13 57.03	2.173	13 55 52.38	140.58	− 7 59 2.8	−622.5	67.40	16 3.6	58 49.9	II. S.
22	14 48.89	2.149	14 51 48.81	139.16	−11 48 38.1	−516.7	67.12	15 48.8	57 55.5	II. S.
23	15 40.21	2.127	15 47 13.27	137.85	−14 50 21.2	−388.2	66.85	15 33.6	56 59.8	II. S.
24	16 30.97	2.101	16 42 3.48	136.26	−16 57 10.9	−247.6	66.51	15 19.6	56 8.2	II. S.
25	17 20.99	2.066	17 36 9.84	134.18	−18 7 12.6	−104.7	66.02	15 7.4	55 23.5	II. N. S.
26	18 10.08	2.023	18 29 19.58	131.57	−18 21 4.9	+ 34.1	65.37	14 57.9	54 48.5	II. N.
27	18 58.04	1.973	19 21 21.72	128.58	−17 41 11.3	163.4	64.58	14 51.2	54 23.9	II. N.
28	19 44.80	1.923	20 12 11.35	125.57	−16 12 0.2	+280.1	63.76	14 47.5	54 10.4	II. N.
29	20 30.41	1.878	21 1 51.78	122.87	−13 59 4.0	381.9	62.99	14 46.6	54 7.3	II. N.
30	21 15.06	1.845	21 50 34.99	120.86	−11 8 39.0	467.3	62.39	14 48.3	54 13.5	II. N.
31	21 59.09	1.828	22 38 40.62	119.79	− 7 47 39.0	534.6	62.04	14 52.3	54 28.0	II. N.
32	22 42.93	1.829	23 26 34.47	119.90	− 4 3 41.1	+581.7	62.01	14 58.0	54 48.9	II. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Apr. 1	22 42.93	1.829	23 26 34.47	119.90	− 4 3 41.1	+581.7	62.01	14 58.0	54 48.9	II. N.
2	23 27.07	1.853	0 14 46.82	121.34	− 0 5 20.7	605.9	62 36	15 5.0	55 14.5	II. N.
4	0 12.06	1.900	1 3 50.30	124.18	+ 3 57 34.2	604.0	63.10	15 12.7	55 43.1	I. N. S.
5	0 58.45	1.969	1 54 17.73	128.32	7 53 52.1	572.3	64.19	15 21.0	56 13.4	I. S.
6	1 46.72	2.056	2 46 38.21	133.54	11 30 59.0	507.5	65.57	15 29.4	56 44.2	I. S.
7	2 37.20	2.152	3 41 12.05	139.33	+14 35 20.0	+408.4	67.09	15 37.7	57 14.8	I. S.
8	3 29.98	2.245	4 38 4.46	144.93	16 53 10.2	275.4	68.55	15 45.8	57 44.6	I. S.
9	4 24.82	2.320	5 37 0.03	149.54	18 12 3.3	+114.9	69.70	15 53.7	58 13.5	I. N. S.
10	5 21.09	2.363	6 37 22.00	152.12	18 22 46.7	− 63.2	70.37	16 1.1	58 40.9	I. N.
11	6 17.95	2.368	7 38 19.40	152.40	17 21 16.9	−243.3	70.47	16 8.0	59 5.9	I. N.
12	7 14.54	2.342	8 39 0.87	150.80	+15 9 48.6	−410.1	70.06	16 13.6	59 26.8	I. N.
13	8 10.24	2.297	9 38 46.81	148.07	11 56 51.9	−548.6	69.30	16 17.7	59 41.7	I. N.
14	9 4.79	2.249	10 37 26.93	145.13	7 56 6.3	−647.8	68.56	16 19.4	59 48.0	I. N.
15	9 58.24	2.203	11 34 59.31	143.69	+ 3 24 44.2	−701.0	67.93	16 18.3	59 43.9	I. N.
16	10 50.89	2.182	12 31 43.40	141 13	− 1 18 11.7	−705.6	67.49	16 14.0	59 28.2	I. N.
17	11 43.09	2.171	13 28 0.90	140.45	− 5 53 27.4	−663.2	67.30	16 6.6	59 0.8	I. N.
18	12 35.15	2.169	14 24 9.46	140.31	−10 3 12.9	−579.2	67.28	15 56.4	58 23.6	II. N. S.
19	13 27.18	2.167	15 20 16.25	140.21	−13 32 29.8	−462.5	67.29	15 44.5	57 39.6	II. N. S.
20	14 19.07	2.156	16 16 14.99	139.56	−16 10 19.6	−324.0	67.18	15 31.7	56 52.9	II. N. S.
21	15 10.53	2.129	17 11 47 39	137.96	−17 50 19.5	−174.8	66.85	15 19.3	56 7.3	II. N. S.
22	16 1,14	2.085	18 6 28.76	135.32	−18 30 39.7	− 27.1	66.25	15 8.2	55 26.4	II. N.
23	16 50.51	2.028	18 59 55.99	131.85	−18 13 19.9	+111.5	65.42	14 59.1	54 53.2	II. N.
24	17 38.42	1.964	19 51 54.55	128.03	−17 3 0.9	237.1	64.46	14 52.7	54 29.6	II. N.
25	18 24.81	1.903	20 42 22.51	124.39	−15 5 53.8	346.0	63.51	14 49.2	54 16.5	II. N.
26	19 9.88	1.855	21 31 30.83	121.44	−12 28 45.5	437.0	62.72	14 48.6	54 14.6	II. N.
27	19 54.00	1.825	22 19 41.54	119.64	− 9 18 32.1	+511.0	62.20	14 51.1	54 23.5	II. N.
28	20 37.66	1.818	23 7 24.87	119.22	− 5 42 19.6	566.9	62.02	14 56.1	54 42.0	II. N.
29	21 21.46	1.837	23 55 16 66	120.36	− 1 47 41.7	602.7	62.27	15 3.4	55 8.7	II. N.
30	22 6.05	1.883	0 43 55.76	123.17	+ 2 16 44.0	615.2	62.95	15 12.3	55 41.5	II. N.
May 1	22 52.07	1.956	1 34 1.46	127.56	6 20 43.4	599.5	64.05	15 22.3	56 18.1	II. N.
2	23 40.13	2 052	2 26 9.35	133.28	+10 11 57.6	+549.3	65.50	15 32.5	56 55.7	II.
4	0 30.65	2.159	3 20 45.42	139.78	13 36 8.9	463.8	67.14	15 42.3	57 31.7	I. N.
5	1 23.76	2.265	4 17 57.85	146.14	16 17 46.2	337.9	68.74	15 51.1	58 4.0	I. N.
6	2 19.20	2.348	5 17 29.31	151.17	18 2 1.8	+178.5	70.01	15 58.4	58 30.7	I. N.
7	3 16.19	2.392	6 18 34.73	153.82	18 37 28.8	− 3.2	70.71	16 4.0	58 51.3	I. N.
8	4 13.68	2.390	7 20 10.01	153.65	+17 58 44.5	−189.4	70.73	16 7.8	59 5.5	I. N.
9	5 10.59	2.347	8 21 10.45	151.06	16 7 47.1	−361.4	70.15	16 10.1	59 13.9	I. N.
10	6 6.15	2.281	9 20 49.86	147.10	13 13 19.8	−504.9	69.21	16 10.9	59 16.8	I. N.
11	7 0.07	2.213	10 18 50.20	142.99	9 28 51.1	−610.7	68.19	16 10.3	59 14.5	I. N.
12	7 52.48	2.158	11 15 19.89	139.67	5 10 21.5	−674.7	67.32	16 8.2	59 6.8	I. N.
13	8 43.81	2.124	12 10 44.87	137.65	+ 0 34 49.5	−695.9	66.76	16 4.6	58 53.4	I. N.
14	9 34.62	2.114	13 5 38.18	137.01	− 4 0 44.9	−675.1	66.55	15 59.3	58 34.1	I. N.
15	10 25.41	2.121	14 0 30.40	137.49	− 8 19 55.6	−614.4	66.62	15 52.4	58 8.7	I. N.
16	11 16.51	2.138	14 55 41.86	138.50	−12 7 32.5	−518.3	66.84	15 44.0	57 37.8	I. N.
17	12 8.02	2.152	15 51 17.05	139.33	−15 10 39.3	−393.4	67.05	15 34.5	57 2.9	II. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
May 17	12 8.02	2.152	15 51 17.05	139.33	−15 10 39.3	−393.4	67.05	15 34.5	57 2.9	II. N.
18	12 59.69	2.151	16 47 2.64	139.25	−17 19 40.4	−249.5	67.05	15 24.3	56 25.6	II. N.
19	13 51.08	2.127	17 42 30.68	137.82	−18 29 19.1	− 98.2	66.73	15 14.4	55 49.1	II. N.
20	14 41.60	2.079	18 37 6.86	134.98	−18 38 43.3	+ 40.6	66.07	15 5.2	55 15.4	II. N.
21	15 30.76	2.015	19 30 21.26	131.11	−17 51 14.6	185.3	65.16	14 57.6	54 47.5	II. N.
22	16 18.28	1.945	20 21 56.84	126.86	−16 12 51.2	+303.5	64.12	14 52.1	54 27.3	II. N.
23	17 4.15	1.880	21 11 53.23	122.96	−13 50 56.6	402.7	63.13	14 49.2	54 16.5	II. N.
24	17 48.63	1.830	22 0 25.94	119.97	−10 53 12.2	482.9	62.36	14 49.0	54 16.1	II. N.
25	18 32.19	1.804	22 48 3.14	118.37	− 7 27 7.1	544.5	61.94	14 51.9	54 26.7	II. N.
26	19 15.45	1.806	23 35 22.06	118.49	− 3 39 59.0	588.0	61.94	14 57.7	54 47.9	II. N.
27	19 59.11	1.838	0 23 5.82	120.48	+ 0 20 37.8	+611.6	62.43	15 6.1	55 18.9	II. N.
28	20 43.96	1.904	1 12 0.69	124.42	4 26 7.1	611.5	63.42	15 16.8	55 58.0	II. N.
29	21 30.76	2.001	2 2 52.82	130.21	8 26 22.9	582.4	64.86	15 28.9	56 42.5	II. N.
30	22 20.18	2.121	2 56 22.53	137.45	12 7 17.9	517.3	66.65	15 41.6	57 29.1	II. N.
31	23 12.65	2.251	3 52 55.54	145.29	15 14 22.5	410.8	68.56	15 53.8	58 14.1	II. N.
June 2	0 8.14	2.369	4 52 31.01	152.41	+17 30 13.2	+262.0	70.28	16 4.6	58 53.4	I. N.
3	1 6.06	2.448	5 54 32.10	157.17	18 39 16.7	+ 79.2	71.43	16 12.8	59 23.7	I. N.
4	2 5.20	2.469	6 57 47.28	158.46	18 31 23.6	−119.1	71.78	16 17.9	59 42.4	I. N.
5	3 4.13	2.432	8 0 49.30	156.18	17 5 4.9	−309.1	71.29	16 19.8	59 49.3	I. N.
6	4 1.61	2.353	9 2 23.63	151.40	14 28 5.1	−469.8	70.21	16 18.6	59 45.1	I. N.
7	4 56.94	2.258	10 1 49.41	145.73	+10 54 56.3	−588.4	68.86	16 15.0	59 31.9	I. N.
8	5 50.08	2.173	10 59 3.00	140.61	6 43 22.2	−661.7	67.63	16 9.6	59 11.9	I. N.
9	6 41.43	2.111	11 54 28.71	136.83	+ 2 11 24.5	−691.1	66.68	16 2.9	58 47.4	I. N.
10	7 31.62	2.077	12 48 44.92	134.81	− 2 24 3.3	−680.0	66.14	15 55.5	58 20.1	I. N.
11	8 21.33	2.070	13 42 32.65	134.41	− 6 47 37.9	−632.2	65.99	15 47.6	57 51.1	I. N.
12	9 11.15	2.084	14 36 26.27	135.21	−10 45 23.3	−551.4	66.14	15 39.4	57 21.0	I. N.
13	10 1.41	2.105	15 30 46.71	136.52	−14 4 58.3	−442.1	66.41	15 31.0	56 50.1	I. N.
14	10 52.16	2.122	16 25 36.72	137.53	−16 36 6.1	−310.4	66.63	15 22.5	56 19.1	I. N.
15	11 43.13	2.122	17 20 40.10	137.52	−18 11 26.9	−164.9	66.61	15 14.3	55 48.7	I. N.
16	12 33.82	2.097	18 15 26.04	136.03	−18 47 30.2	− 15.7	66.24	15 6.4	55 19.7	II. N.
17	13 23.61	2.048	19 9 18.52	133.11	−18 24 55.0	+126.9	65.53	14 59.3	54 53.9	II. N.
18	14 12.02	1.983	20 1 47.53	129.20	−17 8 1.0	254.7	64.59	14 53.5	54 32.6	II. N.
19	14 58.78	1.913	20 52 37.28	124.96	−15 3 41.0	363.5	63.53	14 49.4	54 17.3	II. N.
20	15 43.92	1.851	21 41 49.59	121.19	−12 19 59.9	451.4	62.60	14 47.4	54 10.0	II. N.
21	16 27.74	1.805	22 29 42.40	118.44	− 9 5 11.8	519.3	61.91	14 47.9	54 11.7	II. N.
22	17 10.75	1.784	23 16 46.50	117.19	− 5 27 10.3	+567.7	61.61	14 51.0	54 23.4	II. N.
23	17 53.61	1.793	0 3 41.91	117.74	− 1 33 29.7	597.4	61.79	14 57.1	54 45.6	II. N.
24	18 37.10	1.837	0 51 14.94	120.35	+ 2 28 6.0	607.0	62.47	15 6.0	55 18.3	II. N.
25	19 22.04	1.915	1 40 15.60	125.06	6 28 56.0	593.9	63.69	15 17.5	56 0.4	II. N.
26	20 9.28	2.027	2 31 33.38	131.77	10 18 27.1	549.2	65.39	15 30.9	56 49.9	II. N.
27	20 59.52	2.164	3 25 53.28	140.02	+13 43 25.1	+468.9	67.42	15 45.6	57 43.9	II. N.
28	21 53.21	2.310	4 23 39.90	148.82	16 27 48.8	345.6	69.52	16 0.4	58 38.1	II. N.
29	22 50.24	2.437	5 24 47.94	156.51	18 14 11.2	+179.8	71.32	16 13.7	59 27.1	II. N.
30	23 49.81	2.516	6 28 28.71	161.27	18 47 7.9	− 18.5	72.41	16 24.3	60 5.9	II. N.
July 2	0 50.48	2.596	7 33 15.18	161.88	+17 58 4.1	−226.0	72.57	16 30.9	60 30.3	I. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
July 2	0 50.48	2.526	7 33 15.18	161.88	+17 58 4.1	−286.0	72.57	16 30.9	60 30.3	I. N.
3	1 50.58	2.472	8 37 27.54	158.58	15 48 54.9	−414.6	71.82	16 32.9	60 37.5	I. N.
4	2 48.81	2.376	9 39 47.22	152.81	12 32 2.5	−542.4	70.50	16 30.3	60 28.1	I. N.
5	3 44.54	2.270	10 39 37.30	146.41	8 26 32.6	−656.8	69.01	16 24.0	60 4.8	I. N.
6	4 37.86	2.177	11 37 1.49	140.82	+ 3 53 34.1	−699.8	67.68	16 14.8	59 31.0	I. N.
7	5 29.25	2.111	12 32 30.20	136.85	− 0 47 5.9	−696.5	66.72	16 4.0	58 51.5	I. N.
8	6 19.43	2.075	13 26 45.17	134.68	− 5 18 25.4	−654.2	66.17	15 52.7	58 9.7	I. N.
9	7 9.05	2.065	14 20 27.46	134.07	− 9 26 11.5	−579.7	65.99	15 41.4	57 28.4	I. N.
10	7 58.67	2.072	15 14 9.14	134.52	−12 58 36.4	−478.4	66.05	15 30.8	56 49.6	I. N.
11	8 48.56	2.086	16 8 7.57	135.34	−15 46 1.7	−355.6	66.21	15 21.2	56 14.2	I. N.
12	9 38.73	2.093	17 2 22.46	135.78	−17 41 7.7	−217.0	66.26	15 12.6	55 42.4	I. N.
13	10 28.89	2.083	17 56 36.80	135.21	−18 39 24.7	− 72.8	66.07	15 4.9	55 14.5	I. N.
14	11 18.57	2.052	18 50 22.14	133.35	−18 39 43.6	+ 70.2	65.55	14 58.4	54 50.4	I. N.
15	12 7.25	2.002	19 43 7.89	130.30	−17 44 24.8	203.8	64.77	14 53.0	54 30.6	II. N.
16	12 54.56	1.939	20 34 30.63	126.52	−15 58 49.8	320.8	63.80	14 48.8	54 15.3	II. N.
17	13 40.32	1.875	21 24 20.50	122.67	−13 30 22.8	+417.8	62.83	14 46.2	54 5.6	II. N.
18	14 24.64	1.820	22 12 43.31	119.37	−10 27 26.0	493.4	62.01	14 45.4	54 2.6	II. N.
19	15 7.84	1.783	22 59 58.96	117.15	− 6 58 29.4	547.9	61.47	14 46.4	54 6.3	II. N.
20	15 50.44	1.772	23 46 38.58	116.43	− 3 11 46.2	582.4	61.32	14 49.6	54 18.1	II. N.
21	16 33.10	1.789	0 33 21.68	117.48	+ 0 44 44.8	596.9	61.66	14 55.7	54 40.5	II. N.
22	17 16.57	1.839	1 20 53.65	120.52	+ 4 42 55.8	+590.3	62.51	15 4.3	55 12.1	II. N.
23	18 1.66	1.924	2 10 3.36	125.63	8 33 46.7	559.5	63.87	15 15.5	55 53.4	II. N.
24	18 49.19	2.042	3 1 39.27	132.69	12 6 35.9	499.1	65.68	15 29.1	56 43.2	II. N.
25	19 39.83	2.182	3 56 22.72	141.13	15 8 19.0	402.9	67.78	15 44.4	57 39.5	II. N.
26	20 33.98	2.329	4 54 36.67	149.98	17 23 29.2	266.0	69.89	16 0.5	58 38.4	II. N.
27	21 31.46	2.455	5 56 11.51	157.56	+18 35 45.3	+ 89.5	71.64	16 15.9	59 35.0	II. N.
28	22 31.42	2.530	7 0 15.56	162.15	18 31 23.4	−114.2	72.66	16 29.0	60 23.2	II. N.
29	23 32.41	2.539	8 5 21.74	162.67	17 4 2.1	−321.6	72.75	16 38.2	60 57.0	II. N.
31	0 32.84	2.487	9 9 53.85	159.48	14 18 15.0	−501.8	72.01	16 42.3	61 12.0	I. N.
Aug. 1	1 31.49	2.397	10 12 38.89	154.03	10 29 14.7	−634.1	70.74	16 40.7	61 6.0	I. N.
2	2 27.81	2.298	11 13 4.09	148.09	+ 5 58 53.7	−707.7	69.36	16 33.9	60 41.1	I. N.
3	3 21.88	2.212	12 11 13.85	142.93	+ 1 10 41.7	−724.3	68.15	16 23.0	60 1.3	I. N.
4	4 14.16	2.150	13 7 35.97	139.17	− 3 34 0.6	−692.0	67.27	16 9.7	59 12.2	I. N.
5	5 5.26	2.112	14 2 46.48	136.94	− 7 57 43.0	−621.0	66.74	15 55.2	58 19.2	I. N.
6	5 55.71	2.095	14 57 18.78	135.91	−11 46 54.2	−520.8	66.50	15 41.0	57 27.0	I. N.
7	6 45.92	2.090	15 51 36.14	135.59	−14 51 31.7	−399.4	66.41	15 27.9	56 38.7	I. N.
8	7 36.04	2.086	16 45 47.95	135.35	−17 4 32.2	−263.7	66.31	15 16.3	55 56.3	I. N.
9	8 25.98	2.073	17 39 49.07	134.61	−18 21 40.6	−121.1	66.06	15 6.7	55 20.7	I. N.
10	9 15.46	2.047	18 33 22.68	133.01	−18 41 31.2	+ 21.3	65.59	14 58.8	54 51.8	I. N.
11	10 4.12	2.005	19 26 6.57	130.49	−18 5 32.6	156.8	64.88	14 52.8	54 29.7	I. N.
12	10 51.61	1.951	20 17 40.44	127.24	−16 37 49.8	+279.0	63.99	14 48.4	54 13.6	I. N.
13	11 37.74	1.893	21 7 52.35	123.73	−14 24 42.0	383.4	63.04	14 45.5	54 3.1	I. N.
14	12 22.50	1.839	21 56 42.10	120.50	−11 33 50.0	467.4	62.18	14 44.3	53 58.5	II. N.
15	13 6.10	1.797	22 44 21.64	117.97	− 8 13 38.3	530.0	61.53	14 44.5	53 59.4	II. N.
16	13 48.90	1.774	23 31 13.46	116.57	− 4 32 42.4	+571.2	61.20	14 46.4	54 6.3	II. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Aug. 16	13 48.90	1.774	23 31 13.46	116.57	− 4 32 42.4	+571.2	61.20	14 46.4	54 6.3	II. N.
17	14 31.43	1.774	0 17 48.45	116.60	− 0 39 35.8	590.9	61.27	14 50.2	54 20.2	II. N.
18	15 14.29	1.802	1 4 43.77	118.29	+ 3 17 8.3	589.1	61.78	14 55.8	54 40.9	II. N.
19	15 58.18	1.860	1 52 40.77	121.77	7 8 38.3	564.4	62.77	15 3.7	55 10.0	II. N.
20	16 43.81	1.947	2 42 22.58	126.97	10 45 14.1	514.0	64.20	15 13.9	55 47.2	II. N.
21	17 31.86	2.061	3 34 30.04	133.83	+13 55 53.9	+434.1	65.98	15 26.2	56 32.7	II. N.
22	18 22.85	2.191	4 29 34.84	141.65	16 27 55.5	390.3	67.95	15 40.5	57 24.9	II. N.
23	19 17.01	2.321	5 27 49.84	149.47	18 7 16.5	+170.6	69.84	15 55.9	58 21.7	II. N.
24	20 14.06	2.427	6 28 58.62	155.90	18 40 13.3	− 10.4	71.32	16 11.5	59 19.1	II. N.
25	21 13.17	2.489	7 32 11.28	159.61	17 56 28.0	−209.6	72.14	16 25.8	60 11.5	II. N.
26	22 13.10	2.496	8 36 13.80	160.04	+15 52 58.0	−404.8	72.18	16 37.1	60 52.9	II. N.
27	23 12.61	2.456	9 39 50.30	157.60	12 36 32.5	−570.2	71.56	16 43.7	61 17.2	II. N.
29	0 10.78	2.388	10 42 5.96	153.54	8 23 30.7	−685.3	70.59	16 44.7	61 20.8	I. N.
30	1 7.20	2.315	11 42 37.61	149.14	+ 3 36 26.8	−739.7	69.55	16 39.8	61 2.9	I. N.
31	2 1.97	2.259	12 41 29.46	145.33	− 1 20 16.7	−734.5	68.67	16 29.8	60 26.1	I. N.
Sept. 1	2 55.41	2.205	13 39 1.44	142.51	− 6 4 17.5	−678.0	68.03	16 16.1	59 35.9	I. N.
2	3 47.92	2.173	14 35 37.16	140.60	−10 17 23.1	−581.9	67.62	16 0.5	58 38.6	I. N.
3	4 39.80	2.151	15 31 34.93	139.27	−13 46 12.9	−458.6	67.34	15 44.5	57 39.8	I. N.
4	5 31.18	2.130	16 27 2.82	138.03	−16 22 2.9	−318.7	67.05	15 29.4	56 44.3	I. N.
5	6 22.01	2.104	17 21 57.61	136.46	−18 0 12.4	−171.7	66.65	15 16.1	55 55.5	I. N.
6	7 12.09	2.067	18 16 7.12	134.23	−18 39 27.8	− 25.3	66.06	15 5.1	55 15.0	I. N. S.
7	8 1.15	2.019	19 9 15.26	131.35	−18 21 30.1	+113.4	65.27	14 56.6	54 43.7	I. S.
8	8 48.95	1.963	20 1 7.98	127.99	−17 10 21.5	239.5	64.34	14 50.4	54 21.1	I. S.
9	9 35.38	1.906	20 51 37.95	124.52	−15 11 51.0	349.8	63.36	14 46.6	54 7.0	I. S.
10	10 20.47	1.853	21 40 47.16	121.32	−12 33 0.6	441.2	62.44	14 44.5	53 59.3	I. S.
11	11 4.41	1.811	22 28 47.19	118.82	− 9 21 39.9	+512.1	61.75	14 44.7	54 0.1	I. S.
12	11 47.53	1.786	23 15 58.11	117.28	− 5 46 6.1	562.0	61.32	14 46.3	54 5.9	I. S.
13	12 30.28	1.780	0 2 46.61	116.99	− 1 54 56.5	590.0	61.24	14 49.2	54 16.8	II. N.
14	13 13.18	1.798	0 49 44.31	118.07	+ 2 2 52.7	595.0	61.57	14 53.6	54 33.0	II. N.
15	13 56.81	1.842	1 37 25.91	120.65	5 58 0.7	576.3	62.31	14 59.5	54 54.3	II. N.
16	14 41.77	1.909	2 26 27.05	124.69	+ 9 40 30.3	+531.6	63.44	15 6.7	55 21.1	II. N.
17	15 28.60	1.998	3 17 21.52	130.05	12 59 37.1	458.9	64.90	15 15.6	55 53.5	II. N.
18	16 17.78	2.102	4 10 36.69	136.28	15 43 42.2	356.2	66.56	15 26.0	56 31.7	II. N.
19	17 9.53	2.210	5 6 26.81	142.83	17 40 38.0	223.0	68.23	15 37.9	57 15.6	II. N.
20	18 3.78	2.307	6 4 47.21	148.67	18 38 22.9	+ 61.6	69.67	15 50.9	58 3.4	II. N. S.
21	19 0.06	2.377	7 5 9.73	152.87	+18 27 8.3	−120.0	70.66	16 4.5	58 53.2	II. S.
22	19 57.58	2.409	8 6 46.79	154.82	17 1 31.3	−307.4	71.08	16 17.5	59 40.9	II. S.
23	20 55.42	2.405	9 8 43.58	154.57	14 22 56.2	−481.6	70.96	16 28.6	60 21.8	II. S.
24	21 52.83	2.375	10 10 14.51	152.77	10 40 36.1	−623.0	70.46	16 36.4	60 50.3	II. S.
25	22 49.35	2.334	11 10 51.12	150.30	6 11 0.6	−715.8	69.82	16 39.6	61 2.0	II. S.
26	23 44.90	2.296	12 10 30.04	148.01	+ 1 15 40.3	−751.0	69.25	16 37.6	60 54.6	II. N. S.
28	0 39.64	2.268	13 9 20.03	146.27	− 3 41 57.1	−727.8	68.83	16 30.8	60 27.9	I. N.
29	1 33.81	2.248	14 7 35.41	145.09	− 8 19 35.5	−652.6	68.59	16 18.6	59 45.1	I. N.
30	2 27.56	2.232	15 5 25.04	144.12	−12 18 57.9	−536.9	68.42	16 4.1	58 51.7	I. N.
31	3 20.90	2.211	16 2 51.48	142.91	−15 25 35.6	−394.5	68.18	15 48.3	57 53.7	I. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.		Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Oct.	1	3 20.90	2.211	16 2 51.48	142.91	−15 25 35.6	−394.5	68.18	15 48.3	57 53.7	I. N.
	2	4 13.62	2.179	16 59 39.79	140.97	−17 32 34.9	−239.3	67.76	15 32.6	56 56.1	I. N.
	3	5 5.38	2.132	17 55 30.82	138.13	−18 36 52.4	− 83.1	67.09	15 18.5	56 4.4	I. N. S.
	4	5 55.84	2.071	18 50 2.94	134.44	−18 40 0.8	+ 65.3	66.17	15 6.6	55 20.4	I. S.
	5	6 44.71	2.001	19 42 59.83	130.26	−17 46 33.3	199.3	65.09	14 57.3	54 46.4	I. S.
	6	7 31.90	1.932	20 34 15.30	126.06	−16 2 54.1	+315.9	63.96	14 50.9	54 22.7	I. S.
	7	8 17.49	1.870	21 23 54.79	122.34	−13 36 21.6	413.6	62.91	14 47.1	54 8.9	I. S.
	8	9 1.75	1.822	22 12 14.22	119.45	−10 34 35.3	492.0	62.08	14 46.0	54 5.1	I. S.
	9	9 45.08	1.793	22 59 37.62	117.70	− 7 5 24.5	550.5	61.55	14 47.1	54 9.1	I. S.
	10	10 27.97	1.786	23 46 34.60	117.28	− 3 16 54.5	588.4	61.38	14 50.2	54 20.3	I. S.
	11	11 10.97	1.802	0 33 38.26	118.27	+ 0 42 20.5	+603.9	61.61	14 54.7	54 37.0	I. S.
	12	11 54.65	1.842	1 21 23.16	120.69	4 43 0.1	595.0	62.25	15 0.5	54 58.1	I. S.
	13	12 39.58	1.906	2 10 23.17	124.51	8 34 45.3	558.9	63.27	15 7.2	55 22.6	II. N. S.
	14	13 26.27	1.988	3 1 8.54	129.43	12 6 14.3	493.2	64.56	15 14.6	55 49.6	II. N.
	15	14 15.08	2.081	3 54 1.45	135.04	15 5 14.1	396.5	66.09	15 22.6	56 19.2	II. N.
	16	15 6.15	2.174	4 49 10.82	140.67	+17 19 17.1	+269.0	67.58	15 31.3	56 51.3	II. N.
	17	15 59.34	2.255	5 46 27.41	145.50	18 36 47.2	+114.8	68.83	15 40.5	57 25.2	II. N. S.
	18	16 54.17	2.309	6 45 22.53	148.78	18 48 34.8	− 57.8	69.68	15 50.2	58 0.6	II. S.
	19	17 49.92	2.331	7 45 13.33	150.13	17 49 40.8	−236.4	70.02	15 59.9	58 36.4	II. S.
	20	18 45.84	2.324	8 45 14.17	149.69	15 40 35.8	−406.3	69.91	16 9.4	59 11.1	II. S.
	21	19 41.34	2.299	9 44 49.83	148.16	+12 27 46.9	−552.7	69.49	16 17.7	59 41.6	II. S.
	22	20 36.14	2.269	10 43 43.70	146.36	8 23 13.0	−663.2	68.99	16 23.9	60 4.4	II. S.
	23	21 30.30	2.246	11 41 58.57	145.00	+ 3 43 23.4	−727.8	68.61	16 27.2	60 16.6	II. S.
	24	22 24.07	2.238	12 39 50.71	144.49	− 1 12 3.9	−740.6	68.43	16 26.7	60 14.6	II. S.
	25	23 17.83	2.243	13 37 40.75	144.79	− 6 2 0.4	−700.4	68.48	16 22.0	59 57.5	II. S.
	27	0 11.79	2.254	14 35 43.86	145.48	−10 25 48.9	−611.1	68.65	16 13.4	59 26.1	I. S.
	28	1 5.99	2.261	15 34 1.71	145.89	−14 5 33.8	−489.2	68.78	16 1.7	58 42.8	I. S.
	29	2 0.18	2.251	16 32 18.37	145.27	−16 48 0.5	−327.1	68.69	15 48.1	57 53.0	I. S.
	30	2 53.83	2.215	17 30 2.61	143.14	−18 25 50.4	−161.6	68.23	15 33.9	57 0.7	I. S.
	31	3 46.31	2.154	18 26 36.75	139.46	−18 57 46.9	+ 0.3	67.39	15 20.3	56 10.9	I. S.
Nov.	1	4 37.08	2.075	19 21 28.06	134.68	−18 27 32.3	+148.0	66.24	15 8.4	55 27.3	I. S.
	2	5 25.84	1.968	20 14 17.95	129.48	−17 2 1.9	276.1	64.93	14 59.0	54 52.5	I. S.
	3	6 12.56	1.907	21 5 5.53	124.57	−14 49 37.1	382.4	63.66	14 52.3	54 28.1	I. S.
	4	6 57.50	1.841	21 54 5.98	120.63	−11 58 52.3	468.0	62.59	14 48.6	54 14.6	I. S.
	5	7 41.11	1.797	22 41 46.49	117.98	− 8 37 57.5	533.4	61.84	14 48.0	54 12.2	I. S.
	6	8 23.98	1.780	23 28 41.96	116.91	− 4 54 41.5	+579.7	61.48	14 50.0	54 19.5	I. S.
	7	9 6.75	1.790	0 15 31.64	117.52	− 0 56 53.4	605.9	61.58	14 54.4	54 35.9	I. S.
	8	9 50.10	1.828	1 2 56.57	119.84	+ 3 7 0.9	609.7	62.15	15 0.8	54 59.4	I. S.
	9	10 34.71	1.894	1 51 37.04	123.79	7 7 24.7	587.6	63.15	15 8.6	55 28.0	I. S.
	10	11 21.18	1.962	2 42 9 24	129.10	10 53 4.9	535.3	64.50	15 17.2	55 59.6	I. S.
	11	12 9.95	2.064	3 35 0.28	135.24	+14 11 8.2	+449.1	66.07	15 26.1	56 32.1	II. S.
	12	13 1.22	2.166	4 30 21.28	141.43	16 47 39.6	327.8	67.65	15 34.8	57 4.0	II. S.
	13	13 54.79	2.273	5 28 0.67	146.60	18 29 8.9	175.0	68.97	15 42.8	57 33.7	II. S.
	14	14 50.05	2.325	6 27 21.94	149.78	19 4 44.3	+ 0.4	69.81	15 50.2	58 0.5	II. S.
	15	15 46.09	2.337	7 27 30.07	150.48	+18 28 31.0	−181.2	70.05	15 56.6	58 24.3	II. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Nov. 16	16 41.94	2.312	8 27 27.15	148.96	+16 40 56.5	−353.7	69.74	16 2.2	58 44.8	II. S.
17	17 36.89	2.265	9 26 29.69	146.12	13 48 44.3	−502.4	69.06	16 6.8	59 1.7	II. S.
18	18 30.63	2.214	10 24 19.32	143.07	10 3 31.4	−617.5	68.32	16 10.4	59 15.0	II. S.
19	19 23.27	2.176	11 21 2.98	140.76	5 40 7.4	−692.5	67.71	16 12.6	59 23.1	II. S.
20	20 15.24	2.159	12 17 5.94	139.74	+ 0 55 16.2	−724.2	67.40	16 13.1	59 25.0	II. S.
21	21 7.08	2.166	13 13 1.78	140.14	− 3 53 11.4	−710.4	67.44	16 11.5	59 19.1	II. S.
22	21 59.33	2.191	14 9 21.96	141.67	− 8 26 57.8	−651.0	67.77	16 7.5	59 4.2	II. S.
23	22 52 32	2.224	15 6 26.15	143.66	−12 28 15.9	−548.9	68.22	16 0.9	58 39.9	II. S.
24	23 46.02	2.248	16 4 14.14	145.17	−15 41 20.1	−411.5	68.58	15 52.0	58 7.2	II. S.
26	0 40.07	2.250	17 2 22.50	145.21	−17 54 21.2	−251.0	68.61	15 41.4	57 28.2	I. S.
27	1 33.76	2 217	18 0 8.77	143.27	−19 1 4.0	− 82.4	68.17	15 29.8	56 45.7	I. S.
28	2 26.25	2.152	18 56 43.82	139.35	−19 1 21.9	+ 78.9	67.26	15 18.3	56 3.5	I. S.
29	3 16.89	2.065	19 51 26.98	134.09	−18 0 23.4	223.3	66.01	15 7.8	55 25.0	I. S.
30	4 5.31	1.971	20 43 56.89	128.40	−16 6 34.4	343.9	64.62	14 59.1	54 53.2	I. S.
Dec. 1	4 51.54	1.885	21 34 14.84	123.22	−13 29 40.0	438.2	63.30	14 52.8	54 29.7	I. S.
2	5 35.91	1.818	22 22 40.81	119.18	−10 19 5.6	+511.1	62.25	14 49.2	54 16.8	I. S.
3	6 18.98	1.777	23 9 48.36	116.75	− 6 43 30.2	563.6	61.59	14 48.7	54 15.0	I. S.
4	7 1.44	1.767	23 56 19.27	116.15	− 2 50 45.8	596.9	61.41	14 51.3	54 24.3	I. S.
5	7 44.05	1.790	0 42 59.79	117.55	+ 1 11 28.5	610.9	61.74	14 56.7	54 44.3	I. S.
6	8 27.63	1.847	1 30 37.96	120.95	5 15 0.1	602.8	62.60	15 4.7	55 13.4	I. S.
7	9 12.94	1.934	2 20 0.66	126.21	+ 9 10 11.4	+568.2	63.92	15 14.6	55 49.8	I. S.
8	10 0.67	2.047	3 11 48 95	133.00	12 45 18.3	501.5	65.61	15 25.7	56 30.8	I. S.
9	10 51.28	2.172	4 6 30.56	140.51	15 46 23.0	397.4	67.46	15 37.2	57 13.1	I. S.
10	11 44.84	2.289	5 4 9.68	147.56	17 58 4.0	254.7	69.17	15 48.1	57 53.2	I. S.
11	12 40.89	2.374	6 4 18.03	152.71	19 5 54.3	+ 80.1	70.43	15 57.7	58 28.3	II. S.
12	13 38.40	2.408	7 5 54.89	154.80	+18 59 44.5	−112.0	70.97	16 5.1	58 55.3	II. S.
13	14 36.08	2.389	8 7 41.86	153.61	17 36 49.6	−300.1	70.74	16 10.0	59 13.5	II. S.
14	15 32.76	2.329	9 8 28.18	149.95	15 2 51.3	−464.2	69.92	16 12.4	59 22.3	II. S.
15	16 27.72	2.251	10 7 31.59	145.27	11 30 24.9	−591.0	68.84	16 12.7	59 23.2	II. S.
16	17 20.86	2.180	11 4 45.03	140.98	7 15 58.3	−673.8	67.81	16 11.1	59 17.3	II. S.
17	18 12.52	2.130	12 0 29.80	138.01	+ 2 37 12.9	−712.6	67.07	16 8.1	59 6.3	II. S.
18	19 3.34	2.110	12 55 23.65	136.77	− 2 8 29.4	−709.0	66.75	16 3.9	58 51.1	II. S.
19	19 54.00	2.117	13 50 8.63	137.23	− 6 44 33.4	−664.8	66.82	15 58.8	58 32.4	II. S.
20	20 45.12	2.146	14 45 20.83	138.94	−10 55 17.7	−582.8	67.19	15 52.8	58 10.3	II. S.
21	21 37.05	2.182	15 41 21.42	141.11	−14 26 11.4	−466.5	67.66	15 45.9	57 44.8	II. S.
22	22 29.77	2.203	16 38 9.72	142.74	−17 4 46.9	−322.6	68.01	15 38.1	57 16.1	II. S.
23	23 22.87	2.210	17 35 20.94	142.87	−18 42 4.9	−161.9	68.02	15 29.6	56 44.9	II. N. S.
25	0 15.62	2.178	18 32 11.61	140.98	−19 13 58.4	+ 1.9	67.54	15 20.6	56 11.9	I. N. S.
26	1 7.22	2.116	19 27 52.54	137.14	−18 41 48.0	156.2	66.61	15 11.7	55 39.2	I. S.
27	1 57.00	2.031	20 21 43.97	132.00	−17 11 39.8	290.6	65.35	15 3.4	55 8.7	I. S.
28	2 44.63	1.939	21 13 25.92	126.52	−14 52 41.5	+399.9	64.00	14 56.3	54 42.7	I. S.
29	3 30.14	1.857	22 3 0.81	121.55	−11 55 6.5	483.7	62.76	14 51.0	54 23.3	I. S.
30	4 13.90	1.794	22 50 49.90	117.79	− 8 28 49.6	543.8	61.81	14 48.0	54 12.3	I. S.
31	4 56.47	1.759	23 37 27.86	115.69	− 4 42 48.8	582.9	61.29	14 47.7	54 11.1	I. S.
32	5 38.58	1.756	0 23 37.94	115.49	− 0 45 7.8	+602.4	61.27	14 50.4	54 20.9	I. S.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	22 31.5	17 16 19.33	−20 22 59.7	10.2	3.9	0.27	Feb. 15	23 52.6	21 39 1.09	−16 16 44.9	6.4	2.4	0.17
1	22 29.6	17 18 20.35	20 32 33.5	10.0	3.8	0.26	16	23 55.5	21 45 53.59	15 41 57.9	6.4	2.4	0.17
2	22 28.1	17 20 48.24	20 42 57.6	9.8	3.7	0.26	17	23 58.4	21 52 46.89	15 5 45.3	6.4	2.4	0.17
3	22 27.0	17 23 40.46	20 53 58.3	9.6	3.6	0.26	19	0 1.4	21 59 40.97	14 28 7.4	6.4	2.4	0.17
4	22 26.3	17 26 54.65	21 5 23.0	9.3	3.5	0.25	20	0 4.3	22 6 35.83	13 49 4.7	6.4	2.4	0.17
5	22 26.0	17 30 28.68	−21 17 0.1	9.1	3.4	0.25	21	0 7.3	22 13 31.45	−13 8 38.0	6.4	2.4	0.17
6	22 25.9	17 34 20.57	21 28 39.2	8.9	3.3	0.25	22	0 10.3	22 20 27.80	12 26 48.0	6.4	2.4	0.17
7	22 26.1	17 38 28.57	21 40 11.1	8.8	3.3	0.24	23	0 13.3	22 27 24.84	11 43 35.9	6.4	2.4	0.17
8	22 26.5	17 42 51.13	21 51 27.4	8.6	3.2	0.24	24	0 16.3	22 34 22.51	10 59 2.9	6.5	2.4	0.17
9	22 27.2	17 47 26.86	22 2 20.7	8.4	3.2	0.23	25	0 19.3	22 41 20.73	10 13 11.2	6.5	2.4	0.17
10	22 28.0	17 52 14.49	−22 12 44.2	8.3	3.1	0.23	26	0 22.3	22 48 19.39	− 9 26 2.7	6.5	2.4	0.17
11	22 29.0	17 57 12.88	22 22 32.2	8.1	3.1	0.23	27	0 25.4	22 55 18.35	8 37 39.7	6.6	2.4	0.17
12	22 30.2	18 2 21.06	22 31 39.5	8.0	3.0	0.22	28	0 28.4	23 2 17.43	7 48 6.0	6.6	2.5	0.17
13	22 31.5	18 7 38.17	22 40 1.4	7.9	3.0	0.22	Mar. 1	0 31.5	23 9 16.38	6 57 25.4	6.7	2.5	0.17
14	22 33.0	18 13 3.38	22 47 33.8	7.8	2.9	0.22	2	0 34.5	23 16 14.89	6 5 42.5	6.7	2.5	0.17
15	22 34.6	18 18 35.97	−22 54 13.0	7.7	2.9	0.21	3	0 37.5	23 23 12.58	− 5 13 2.8	6.8	2.5	0.17
16	22 36.3	18 24 15.31	22 59 55.6	7.6	2.9	0.21	4	0 40.5	23 30 8.99	4 19 32.8	6.8	2.6	0.17
17	22 38.1	18 30 0.85	23 4 38.6	7.5	2.8	0.21	5	0 43.4	23 37 3.56	3 25 20.1	6.9	2.6	0.18
18	22 40.0	18 35 52.07	23 8 19.5	7.4	2.8	0.20	6	0 46.3	23 43 55.64	2 30 33.5	7.0	2.7	0.18
19	22 42.0	18 41 48.50	23 10 56.0	7.4	2.7	0.20	7	0 49.2	23 50 44.44	1 35 23.0	7.1	2.7	0.18
20	22 44.1	18 47 49.70	−23 12 25.9	7.3	2.7	0.20	8	0 52.0	23 57 29.03	− 0 39 50.9	7.2	2.7	0.18
21	22 46.3	18 53 55.29	23 12 47.1	7.2	2.7	0.20	9	0 54.7	0 4 8.40	+ 0 15 23.4	7.3	2.8	0.19
22	22 48.5	19 0 4.93	23 11 58.1	7.1	2.7	0.20	10	0 57.3	0 10 41.39	1 10 33.6	7.5	2.8	0.19
23	22 50.7	19 6 18.30	23 9 57.2	7.1	2.6	0.20	11	0 59.8	0 17 6.72	2 5 15.9	7.6	2.9	0.19
24	22 53.0	19 12 35.09	23 6 42.9	7.0	2.6	0.19	12	1 2.1	0 23 22.99	2 59 14.3	7.7	2.9	0.19
25	22 55.4	19 18 55.04	−23 2 13.8	6.9	2.6	0.19	13	1 4.2	0 29 28.73	+ 3 52 12.5	7.9	3.0	0.20
26	22 57.9	19 25 17.90	22 56 28.9	6.9	2.6	0.19	14	1 6.2	0 35 22.39	4 43 53.9	8.1	3.1	0.20
27	23 0.3	19 31 43.44	22 49 27.1	6.8	2.6	0.19	15	1 7.9	0 41 2.37	5 34 1.2	8.3	3.1	0.21
28	23 2.8	19 38 11.44	22 41 7.5	6.8	2.5	0.19	16	1 9.4	0 46 27.05	6 22 17.9	8.5	3.2	0.21
29	23 5.4	19 44 41.72	22 31 29.0	6.7	2.5	0.18	17	1 10.6	0 51 34.81	7 8 27.9	8.7	3.3	0.22
30	23 8.0	19 51 14.11	−22 20 30.8	6.7	2.5	0.18	18	1 11.4	0 56 24.12	+ 7 52 15.3	8.9	3.4	0.22
31	23 10.6	19 57 48.44	22 8 12.2	6.7	2.5	0.18	19	1 12.0	1 0 53.50	8 33 25.6	9.2	3.5	0.23
Feb. 1	23 13.3	20 4 24.55	21 54 32.5	6.6	2.5	0.18	20	1 12.2	1 5 1.56	9 11 44.9	9.4	3.6	0.23
2	23 16.0	20 11 2.31	21 39 30.9	6.6	2.5	0.18	21	1 12.0	1 8 47.05	9 47 0.9	9.7	3.7	0.24
3	23 18.7	20 17 41.59	21 23 7.0	6.6	2.5	0.18	22	1 11.4	1 12 8.85	10 19 2.4	10.0	3.8	0.25
4	23 21.4	20 24 22.27	−21 5 20.2	6.5	2.5	0.18	23	1 10.4	1 15 5.98	+10 47 39.1	10.3	3.9	0.26
5	23 24.2	20 31 4.26	20 46 10.1	6.5	2.5	0.18	24	1 9.1	1 17 37.68	11 12 41.8	10.6	4.0	0.27
6	23 26.9	20 37 47.47	20 25 36.1	6.5	2.5	0.18	25	1 7.3	1 19 43.40	11 34 2.5	11.0	4.2	0.28
7	23 29.7	20 44 31.82	20 3 37.9	6.4	2.5	0.18	26	1 5.0	1 21 22.77	11 51 34.7	11.3	4.3	0.29
8	23 32.5	20 51 17.24	19 40 15.1	6.4	2.4	0.17	27	1 2.3	1 22 35.63	12 5 13.1	11.6	4.4	0.30
9	23 35.3	20 58 3.65	−19 15 27.3	6.4	2.4	0.17	28	0 59.1	1 23 22.12	+12 14 53.7	11.9	4.5	0.31
10	23 38.2	21 4 51.02	18 49 14.3	6.4	2.4	0.17	29	0 55.5	1 23 42.66	12 20 33.9	12.3	4.6	0.32
11	23 41.0	21 11 39.32	18 21 35.9	6.4	2.4	0.17	30	0 51.4	1 23 38.01	12 22 13.0	12.6	4.8	0.33
12	23 43.9	21 18 28.50	17 52 31.8	6.4	2.4	0.17	31	0 47.0	1 23 9.19	12 19 52.7	13.0	4.9	0.33
13	23 46.8	21 25 18.53	17 22 1.9	6.4	2.4	0.17	32	0 42.3	1 22 17.54	12 13 36.7	13.3	5.0	0.34
14	23 49.7	21 32 9.40	−16 50 6.3	6.4	2.4	0.17	33	0 37.1	1 21 4.79	+12 3 31.6	13.6	5.1	0.35
15	23 52.6	21 39 1.09	−16 16 44.9	6.4	2.4	0.17	34	0 31.6	1 19 32.96	+11 49 47.0	13.9	5.2	0.36

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	0 42.3	1 22 17.54	+12 13 36.7	13.3	5.0	0.34	May 16	22 25.9	2 6 53.90	+ 9 46 27.6	8.9	3.4	0.23
2	0 37.1	1 21 4.79	12 3 31.6	13.6	5.1	0.35	17	22 27.4	2 12 20.84	10 20 10.2	8.7	3.3	0.22
3	0 31.6	1 19 32.96	11 49 47.0	13.9	5.2	0.36	18	22 29.1	2 17 57.46	10 54 44.2	8.5	3.2	0.22
4	0 25.9	1 17 44.41	11 32 35.9	14.1	5.3	0.36	19	22 30.9	2 23 43.90	11 30 5.1	8.4	3.2	0.21
5	0 19.9	1 15 41.77	11 12 14.5	14.4	5.4	0.37	20	22 32.9	2 29 40.34	12 6 8.4	8.2	3.1	0.21
6	0 13.8	1 13 27.83	+10 49 2.5	14.7	5.5	0.38	21	22 35.0	2 35 46.95	+12 42 49.2	8.1	3.1	0.21
7	0 7.6	1 11 5.59	10 23 22.3	14.9	5.6	0.38	22	22 37.3	2 42 3.98	13 20 2.2	8.0	3.0	0.20
8	0 1.2	1 8 38.14	9 55 39.1	15.0	5.6	0.38	23	22 39.8	2 48 31.68	13 57 41.9	7.9	3.0	0.20
8	23 54.8	1 6 8.56	9 26 19.9	15.1	5.7	0.38	24	22 42.5	2 55 10.28	14 35 42.6	7.8	2.9	0.20
9	23 48.4	1 3 39.89	8 55 53.4	15.2	5.7	0.39	25	22 45.4	3 2 0.03	15 13 58.2	7.7	2.9	0.20
10	23 42.0	1 1 15.05	+ 8 24 48.9	15.3	5.8	0.39	26	22 48.5	3 9 1.17	+15 52 21.7	7.6	2.9	0.20
11	23 35.7	0 58 56.69	7 53 34.9	15.3	5.8	0.39	27	22 51.8	3 16 13.93	16 30 45.4	7.5	2.8	0.19
12	23 29.6	0 56 47.24	7 22 39.2	15.2	5.8	0.39	28	22 55.3	3 23 38.50	17 9 1.6	7.4	2.8	0.19
13	23 23.8	0 54 48.84	6 52 28.0	15.2	5.8	0.38	29	22 58.9	3 31 15.06	17 47 1.7	7.3	2.8	0.19
14	23 18.2	0 53 3.35	6 23 24.7	15.1	5.7	0.38	30	23 2.7	3 39 3.70	18 24 36.3	7.2	2.7	0.19
15	23 12.7	0 51 32.25	+ 5 55 50.3	15.0	5.7	0.38	31	23 6.7	3 47 4.43	+19 1 35.4	7.1	2.7	0.19
16	23 7.5	0 50 16.74	5 30 2.8	14.9	5.6	0.37	June 1	23 11.0	3 55 17.18	19 37 48.3	7.0	2.7	0.19
17	23 2.5	0 49 17.69	5 6 17.1	14.7	5.6	0.37	2	23 15.5	4 3 41.77	20 13 3.5	6.9	2.6	0.19
18	22 57.9	0 48 35.69	4 44 45.1	14.5	5.5	0.37	3	23 20.2	4 12 17.89	20 47 9.2	6.8	2.6	0.19
19	22 53.6	0 48 11.12	4 25 36.0	14.4	5.4	0.36	4	23 25.0	4 21 5.04	21 19 53.0	6.8	2.6	0.19
20	22 49.6	0 48 4.12	+ 4 8 56.4	14.2	5.3	0.36	5	23 30.0	4 30 2.54	+21 51 2.7	6.8	2.6	0.19
21	22 45.8	0 48 14.62	3 54 50.3	14.0	5.2	0.35	6	23 35.1	4 39 9.58	22 20 25.5	6.8	2.6	0.19
22	22 42.3	0 48 42.42	3 43 20.0	13.7	5.2	0.35	7	23 40.4	4 48 25.17	22 47 49.4	6.7	2.5	0.19
23	22 39.1	0 49 27.22	3 34 26.0	13.5	5.1	0.34	8	23 45.8	4 57 48.12	23 13 2.9	6.7	2.5	0.19
24	22 36.2	0 50 28.60	3 28 7.1	13.2	5.0	0.33	9	23 51.3	5 7 17.09	23 35 55.5	6.7	2.5	0.18
25	22 33.6	0 51 46.07	+ 3 24 21.4	13.0	4.9	0.33	10	23 56.9	5 16 50.65	+23 56 17.7	6.7	2.5	0.18
26	22 31.2	0 53 19.13	3 23 6.0	12.8	4.8	0.32	12	0 2.6	5 26 27.26	24 14 1.9	6.7	2.5	0.18
27	22 29.0	0 55 7.23	3 24 17.1	12.5	4.7	0.31	13	0 8.3	5 36 5.29	24 29 2.1	6.7	2.5	0.19
28	22 27.1	0 57 9.79	3 27 50.5	12.3	4.7	0.31	14	0 13.9	5 45 43.13	24 41 13.8	6.7	2.5	0.19
29	22 25.5	0 59 26.26	3 33 41.4	12.1	4.6	0.30	15	0 19.5	5 55 19.19	24 50 34.9	6.7	2.5	0.19
30	22 24.0	1 1 56.12	+ 3 41 45.3	11.9	4.5	0.30	16	0 25.1	6 4 51.94	+24 57 5.0	6.8	2.6	0.19
May 1	22 22.8	1 4 38.82	3 51 57.1	11.7	4.4	0.29	17	0 30.7	6 14 19.97	25 0 45.3	6.8	2.6	0.19
2	22 21.8	1 7 33.87	4 4 11.9	11.5	4.3	0.28	18	0 36.1	6 23 41.96	25 1 38.6	6.8	2.6	0.19
3	22 21.0	1 10 40.80	4 18 24.6	11.2	4.3	0.28	19	0 41.3	6 32 56.71	24 59 49.2	6.9	2.6	0.19
4	22 20.3	1 13 59.19	4 34 30.2	11.0	4.2	0.27	20	0 46.5	6 42 3.21	24 55 22.5	6.9	2.6	0.19
5	22 19.8	1 17 28.67	+ 4 52 23.9	10.8	4.1	0.27	21	0 51.5	6 51 0.56	+24 48 25.0	7.0	2.6	0.19
6	22 19.6	1 21 8.89	5 12 1.0	10.6	4.0	0.27	22	0 56.4	6 59 48.03	24 39 3.3	7.0	2.6	0.19
7	22 19.5	1 24 59.53	5 33 16.6	10.4	3.9	0.26	23	1 1.0	7 8 24.99	24 27 25.2	7.1	2.7	0.20
8	22 19.6	1 29 0.33	5 56 6.2	10.2	3.9	0.26	24	1 5.5	7 16 50.95	24 13 38.6	7.2	2.7	0.20
9	22 19.8	1 33 11.05	6 20 25.3	10.0	3.8	0.25	25	1 9.8	7 25 5.53	23 57 51.3	7.3	2.7	0.20
10	22 20.2	1 37 31.51	+ 6 46 9.6	9.8	3.7	0.25	26	1 13.9	7 33 8.47	+23 40 11.5	7.4	2.7	0.20
11	22 20.7	1 42 1.58	7 13 14.8	9.6	3.7	0.25	27	1 17.8	7 40 59.55	23 20 47.2	7.5	2.8	0.20
12	22 21.4	1 46 41.17	7 41 36.8	9.5	3.6	0.24	28	1 21.5	7 48 38.63	22 59 46.5	7.5	2.8	0.21
13	22 22.3	1 51 30 20	8 11 11.2	9.3	3.5	0.24	29	1 25.0	7 56 5.64	22 37 16.9	7.6	2.8	0.21
14	22 23.4	1 56 28.65	8 41 53.9	9.1	3.5	0.23	30	1 28.3	8 3 20.56	22 13 25.9	7.7	2.9	0.21
15	22 24.6	2 1 36.54	+ 9 13 40.7	9.0	3.4	0.23	31	1 31.4	8 10 23.39	+21 48 20.8	7.8	2.9	0.21
16	22 25.9	2 6 53.90	+ 9 46 27.6	8.9	3.4	0.23	32	1 34.3	8 17 14.14	+21 22 8.8	7.9	3.0	0.21

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	1 31.4	8 10 23.39	+21 48 20.8	7.8	2.9	0.21	Aug. 15	23 55.6	9 35 35.92	+ 9 35 13.9	14.2	5.4	0.37
2	1 34.3	8 17 14.14	21 22 8.8	7.9	3.0	0.21	16	23 48.8	9 32 38.78	9 59 52.9	14.1	5.3	0.36
3	1 37.0	8 23 52.87	20 54 56.6	8.0	3.0	0.22	17	23 42.1	9 29 51.70	10 25 18.7	13.9	5.3	0.36
4	1 39.5	8 30 19.65	20 26 50.8	8.2	3.1	0.22	18	23 35.6	9 27 18.37	10 51 6.7	13.8	5.2	0.36
5	1 41.8	8 36 34.54	19 57 57.8	8.3	3.1	0.22	19	23 29.4	9 25 2.26	11 16 51.7	13.6	5.1	0.35
6	1 43.9	8 42 37.59	+19 28 23.7	8.4	3.2	0.22	20	23 23.6	9 23 6.67	+11 42 9.7	13.3	5 0	0.34
7	1 45.8	8 48 28.85	18 58 14.6	8.5	3.2	0.23	21	23 18.1	9 21 34.48	12 6 36.6	13.0	4.9	0.34
8	1 47.5	8 54 8.39	18 27 36.2	8.7	3.3	0.23	22	23 13.1	9 20 28.27	12 29 49.8	12.7	4.8	0.33
9	1 49.0	8 59 36.22	17 56 34.0	8.8	3.4	0.23	23	23 8.5	9 19 50.16	12 51 28.3	12.4	4.7	0.32
10	1 50.3	9 4 52.35	17 25 13.7	8.9	3.4	0.24	24	23 4.4	9 19 41.84	13 11 12.7	12.1	4.6	0.31
11	1 51.5	9 9 56.79	+16 53 40.8	9.0	3.5	0.24	25	23 0.8	9 20 4.54	+13 28 45.8	11.7	4.4	0.30
12	1 52.5	9 14 49.50	16 22 0.3	9.2	3.5	0.24	26	22 57.8	9 20 59.08	13 43 51.4	11.4	4.3	0.30
13	1 53.2	9 19 30.42	15 50 17.9	9.3	3.6	0.25	27	22 55.3	9 22 25.78	13 56 15.7	11.0	4.1	0.29
14	1 53.7	9 23 59.49	15 18 38.9	9.5	3.7	0.25	28	22 53.3	9 24 24.64	14 5 46.8	10.7	4.0	0.28
15	1 54.0	9 28 16.61	14 47 8.4	9.7	3.7	0.25	29	22 51.9	9 26 55.17	14 12 14.3	10.4	3.9	0.27
16	1 54.2	9 32 21.62	+14 15 51.8	9.9	3.8	0.26	30	22 51.0	9 29 56.58	+14 15 29.8	10.1	3.8	0.26
17	1 54.2	9 36 14.34	13 44 54.7	10.0	3.8	0.26	31	22 50.6	9 33 27.73	14 15 26.6	9.8	3.7	0.26
18	1 54.0	9 39 54.58	13 14 22.6	10.2	3.9	0.26	Sept. 1	22 50.6	9 37 27.16	14 12 0.0	9.5	3.6	0.25
19	1 53.5	9 43 22.10	12 44 21.0	10.4	3.9	0.27	2	22 51.0	9 41 53.14	14 5 7.3	9.2	3.5	0.24
20	1 52.8	9 46 36.63	12 14 55.6	10.6	4.0	0.27	3	22 51.9	9 46 43.72	13 54 48.1	9.0	3.4	0.23
21	1 51.8	9 49 37.85	+11 46 12.5	10.8	4.1	0.27	4	22 53.2	9 51 56.80	+13 41 3.7	8.7	3.3	0.23
22	1 50.6	9 52 25.41	11 18 18.0	11.0	4.1	0.28	5	22 54.8	9 57 30.09	13 23 57.9	8.5	3.2	0.22
23	1 49.2	9 54 58.93	10 51 18.4	11.1	4.2	0.28	6	22 56.7	10 3 21.26	13 3 36.2	8.3	3.1	0.22
24	1 47.6	9 57 18.01	10 25 20.4	11.3	4.3	0.29	7	22 58.9	10 9 27.90	12 40 6.8	8.1	3.0	0.21
25	1 45.8	9 59 22.21	10 0 30.9	11.5	4.4	0.29	8	23 1.3	10 15 47.67	12 13 38.9	7.9	3.0	0.21
26	1 43.7	10 1 11.04	+ 9 36 57.1	11.7	4.5	0.30	9	23 3.9	10 22 18.29	+11 44 23.5	7.7	2.9	0.20
27	1 41.3	10 2 44.01	9 14 46.8	11.9	4.5	0.30	10	23 6.6	10 28 57.59	11 12 32.6	7.5	2.8	0.20
28	1 38.6	10 4 0.61	8 54 7.7	12.2	4.6	0.31	11	23 9.4	10 35 43.58	10 38 19.2	7.4	2.8	0.19
29	1 35.6	10 5 0.37	8 35 7.7	12.4	4.7	0.31	12	23 12.3	10 42 34.45	10 1 56.6	7.3	2.7	0.19
30	1 32.4	10 5 42.79	8 17 55.2	12.6	4.8	0.32	13	23 15.2	10 49 28.58	9 23 38.3	7.2	2.7	0.18
31	1 28.9	10 6 7.40	+ 8 2 38.7	12.8	4.8	0.33	14	23 18.2	10 56 24.54	+ 8 43 37.7	7.1	2.7	0.18
Aug. 1	1 25.1	10 6 13.81	7 49 26.4	13.0	4.9	0.33	15	23 21.1	11 3 21.14	8 2 7.6	7.0	2.6	0.18
2	1 21.0	10 6 1.70	7 38 26.7	13.2	5.0	0.34	16	23 24.1	11 10 17.35	7 19 20.4	6.9	2.6	0.17
3	1 16.6	10 5 30.83	7 29 47.7	13.4	5.0	0.34	17	23 27.1	11 17 12.32	6 35 27.8	6.8	2.6	0.17
4	1 11.8	10 4 41.11	7 23 37.0	13.6	5.1	0.35	18	23 30.0	11 24 5.42	5 50 40.8	6.7	2.5	0.17
5	1 6.7	10 3 32.66	+ 7 20 1.8	13.8	5.2	0.35	19	23 32.9	11 30 56.09	+ 5 5 9.2	6.7	2.5	0.17
6	1 1.3	10 2 5.78	7 19 7.6	14.0	5.2	0.35	20	23 35.8	11 37 43.98	4 19 2.2	6.6	2.5	0.16
7	0 55.7	10 0 21.05	7 20 58.8	14.1	5.3	0.36	21	23 38.6	11 44 28.79	3 32 28.1	6.6	2.5	0.16
8	0 49.8	9 58 19.33	7 25 38.2	14.3	5.3	0.36	22	23 41.4	11 51 10.30	2 45 34.3	6.5	2.5	0.16
9	0 43.6	9 56 1.81	7 33 6.6	14.4	5.4	0.37	23	23 44.0	11 57 48.43	1 58 27.7	6.5	2.4	0.16
10	0 37.1	9 53 30.09	+ 7 43 21.7	14.5	5.4	0.37	24	23 46.6	12 4 23.15	+ 1 11 14.4	6.4	2.4	0.16
11	0 30.4	9 50 46.12	7 56 19.0	14.6	5.4	0.37	25	23 49.2	12 10 54.46	+ 0 23 59.7	6.4	2.4	0.16
12	0 23.6	9 47 52.19	8 11 50.6	14.6	5.5	0.37	26	23 51.7	12 17 22.42	− 0 23 11.4	6.4	2.4	0.16
13	0 16.7	9 44 51.00	8 29 45.4	14.5	5.5	0.37	27	23 54.1	12 23 47.11	1 10 14.6	6.3	2.4	0.16
14	0 9.7	9 41 45.64	8 49 49.5	14.5	5.5	0.37	28	23 56.6	12 30 8.65	1 57 5.9	6.3	2.4	0.16
15	0 2.6	9 38 39.44	+ 9 11 45.5	14.4	5.4	0.37	29	23 59.0	12 36 27.17	− 2 43 41.9	6.3	2.4	0.16
15	23 55.6	9 35 35.92	+ 9 35 13.9	14.2	5.4	0.37	31	0 1.3	12 42 42.81	− 3 29 59.6	6.3	2.4	0.16

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	0 1.3	12 42 42.81	− 3 29 59.6	6.3	2.4	0.16	Nov. 16	1 17.4	17 0 24.39	−25 17 22.3	9.3	3.5	0.26
2	0 3.5	12 48 55.73	4 15 55.9	6.3	2.4	0.16	17	1 16.8	17 3 46.31	25 17 37.2	9.5	3.6	0.26
3	0 5.7	12 55 6.10	5 1 28.5	6.3	2.4	0.16	18	1 15.8	17 6 44.70	25 16 4.2	9.7	3.7	0.27
4	0 7.9	13 1 14.10	5 46 35.0	6.3	2.4	0.16	19	1 14.4	17 9 16.61	25 12 39.6	10.0	3.8	0.27
5	0 10.1	13 7 19.89	6 31 13.4	6.3	2.4	0.16	20	1 12.5	17 11 18.85	25 7 19.5	10.2	3.9	0.28
6	0 12.2	13 13 23.65	− 7 15 21.7	6.3	2.4	0.16	21	1 10.1	17 12 48.14	−24 59 59.2	10.5	4.0	0.29
7	0 14.3	13 19 25.55	7 58 58.2	6.3	2.4	0.16	22	1 7.1	17 13 41.12	24 50 33.9	10.8	4.1	0.30
8	0 16.3	13 25 25.74	8 42 1.1	6.3	2.4	0.16	23	1 3.4	17 13 54.57	24 38 58.5	11.1	4.2	0.30
9	0 18.4	13 31 24.39	9 24 28.9	6.3	2.4	0.16	24	0 59.0	17 13 25.61	24 25 7.7	11.3	4.3	0.31
10	0 20.4	13 37 21.67	10 6 20.4	6.3	2.4	0.16	25	0 53.8	17 12 11.97	24 8 57.1	11.6	4.4	0.32
11	0 22.4	13 43 17.72	−10 47 34.0	6.3	2.4	0.16	26	0 47.9	17 10 12.27	−23 50 23.1	11.9	4.5	0.32
12	0 24.4	13 49 12.68	11 28 8.4	6.3	2.4	0.16	27	0 41.2	17 7 26.47	23 29 25.1	12.2	4.6	0.33
13	0 26.3	13 55 6.67	12 8 2.3	6.3	2.4	0.16	28	0 33.7	17 3 56.15	23 6 6.3	12.4	4.6	0.34
14	0 28.2	14 0 59.85	12 47 14.5	6.3	2.4	0.16	29	0 25.6	16 59 44.93	22 40 36.0	12.6	4.7	0.34
15	0 30.2	14 6 52.32	13 25 43.7	6.4	2.4	0.16	30	0 16.9	16 54 58.52	22 13 10.7	12.7	4.8	0.34
16	0 32.1	14 12 44.19	−14 3 28.8	6.4	2.4	0.17	Dec. 1	0 7.8	16 49 44.74	−21 44 16.2	12.9	4.8	0.35
17	0 34.0	14 18 35.53	14 40 28.6	6.4	2.4	0.17	1	23 58.4	16 44 13.27	21 14 27.3	13.0	4.9	0.35
18	0 35.9	14 24 26.42	15 16 41.9	6.5	2.4	0.17	2	23 48.9	16 38 34.95	20 44 27.7	12.9	4.9	0.35
19	0 37.8	14 30 16.92	15 52 7.4	6.5	2.4	0.17	3	23 39.4	16 33 1.09	20 15 6.4	12.8	4.8	0.35
20	0 39.7	14 36 7.11	16 26 43.9	6.5	2.5	0.17	4	23 30.1	16 27 42.62	19 47 13.7	12.7	4.8	0.34
21	0 41.6	14 41 57.01	−17 0 30.1	6.5	2.5	0.18	5	23 21.4	16 22 49.29	−19 21 37.6	12.6	4.7	0.34
22	0 43.4	14 47 46.64	17 33 24.7	6.6	2.5	0.18	6	23 13.2	16 18 29.08	18 58 59.6	12.5	4.7	0.34
23	0 45.3	14 53 35.98	18 5 26.4	6.6	2.5	0.18	7	23 5.6	16 14 47.87	18 39 51.0	12.3	4.6	0.33
24	0 47.2	14 59 25.01	18 36 33.7	6.7	2.5	0.18	8	22 58.7	16 11 49.42	18 24 31.7	12.1	4.5	0.33
25	0 49.1	15 5 13.67	19 6 45.3	6.7	2.6	0.18	9	22 52.6	16 9 35.60	18 13 10.9	11.8	4.4	0.32
26	0 50.9	15 11 1.90	−19 35 59.8	6.8	2.6	0.19	10	22 47.1	16 8 6.55	−18 5 47.9	11.5	4.3	0.31
27	0 52.8	15 16 49.58	20 4 15.7	6.8	2.6	0.19	11	22 42.4	16 7 21.16	18 2 13.4	11.1	4.2	0.30
28	0 54.6	15 22 36.59	20 31 31.4	6.9	2.6	0.19	12	22 38.4	16 7 17.38	18 2 12.1	10.8	4.1	0.29
29	0 56.4	15 28 22.74	20 57 45.1	7.0	2.6	0.19	13	22 35.0	16 7 52.59	18 5 24.8	10.5	4.0	0.28
30	0 58.2	15 34 7.84	21 22 55.3	7.0	2.7	0.19	14	22 32.2	16 9 3.85	18 11 29.9	10.2	3.9	0.27
31	1 0.0	15 39 51.61	−21 47 0.3	7.1	2.7	0.20	15	22 30.0	16 10 48.08	−18 20 5.5	9.9	3.8	0.27
Nov. 1	1 1.7	15 45 33.76	22 9 58.4	7.2	2.7	0.20	16	22 28.3	16 13 2.21	18 30 49.4	9.7	3.7	0.26
2	1 3.4	15 51 13.92	22 31 47.6	7.3	2.8	0.20	17	22 27.1	16 15 43.38	18 43 20.7	9.5	3.6	0.25
3	1 5.1	15 56 51.69	22 52 26.1	7.4	2.8	0.20	18	22 26.3	16 18 48.88	18 57 19.5	9.3	3.5	0.25
4	1 6.8	16 2 26.58	23 11 52.0	7.5	2.8	0.21	19	22 25.8	16 22 16.18	19 12 27.3	9.1	3.5	0.24
5	1 8.4	16 7 58.02	−23 30 3.1	7.6	2.9	0.21	20	22 25.6	16 26 3.05	−19 28 27.7	8.9	3.4	0.24
6	1 9.9	16 13 25.36	23 46 57.4	7.7	2.9	0.22	21	22 25.7	16 30 7.46	19 45 5.8	8.7	3.3	0.23
7	1 11.3	16 18 47.84	24 2 32.8	7.8	2.9	0.22	22	22 26.1	16 34 27.58	20 2 8.3	8.5	3.3	0.23
8	1 12.6	16 24 4.65	24 16 47.2	7.9	3.0	0.23	23	22 26.7	16 39 1.82	20 19 23.0	8.3	3.2	0.23
9	1 13.8	16 20 14.79	24 29 38.4	8.1	3.0	0.23	24	22 27.5	16 43 48.74	20 36 39.8	8.2	3.1	0.22
10	1 14.9	16 34 17.14	−24 41 4.1	8.2	3.1	0.24	25	22 28.5	16 48 47.08	−20 53 49.1	8.0	3.1	0.22
11	1 15.9	16 39 10.45	24 51 1.9	8.3	3.1	0.24	26	22 29.7	16 53 55.75	21 10 42.7	7.9	3.0	0.22
12	1 16.7	16 43 53.27	24 59 29.2	8.5	3.2	0.24	27	22 31.1	16 59 13.77	21 27 13.3	7.8	3.0	0.21
13	1 17.3	16 48 24.02	25 6 23.5	8.7	3.3	0.25	28	22 32.6	17 4 40.30	21 43 14.4	7.6	2.9	0.21
14	1 17.6	16 52 40.85	25 11 42.4	8.9	3.3	0.25	29	22 34.2	17 10 14.55	21 58 40.5	7.5	2.9	0.21
15	1 17.7	16 56 41.73	−25 15 23.0	9.1	3.4	0.26	30	22 36.0	17 15 55.85	−22 13 26.2	7.4	2.8	0.20
16	1 17.4	17 0 24.39	−25 17 22.3	9.3	3.5	0.26	31	22 37.8	17 21 43.60	−22 27 26.9	7.3	2.8	0.20

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	3 9.5	21 51 7.58	−13 27 43.5	17.6	17.0	1.17	Feb. 15	0 21.7	22 4 11.84	− 2 58 24.9	32.2	31.1	2.08
1	3 8.4	21 53 56.22	13 4 33.7	17.8	17.2	1.18	16	0 15.4	22 1 47.09	3 5 26.0	32.2	31.1	2.08
2	3 7.1	21 56 40.28	12 41 23.3	18.1	17.4	1.20	17	0 9.1	21 59 21.78	3 13 24.4	32.3	31.2	2.09
3	3 5.8	21 59 19.63	12 18 13.7	18.4	17.7	1.21	18	0 2.7	21 56 56.88	3 22 16.1	32.2	31.2	2.09
4	3 4.4	22 1 54.13	11 55 6.3	18.6	17.9	1.23	18	23 56.4	21 54 33.35	3 31 56.8	32.2	31.1	2.08
5	3 3.0	22 4 23.65	−11 32 2.3	18.9	18.2	1.24	19	23 50.1	21 52 12.13	− 3 42 21.8	32.1	31.1	2.08
6	3 1.5	22 6 48.05	11 9 3.3	19.2	18.5	1.25	20	23 43.9	21 49 54.14	3 53 26.0	32.0	31.0	2.07
7	2 59.9	22 9 7.16	10 46 10.6	19.5	18.8	1.27	21	23 37.7	21 47 40.28	4 5 4.4	31.8	30.8	2.06
8	2 58.2	22 11 20.82	10 23 25.8	19.8	19.1	1.28	22	23 31.6	21 45 31.39	4 17 11.9	31.6	30.6	2.05
9	2 56.4	22 13 28.87	10 0 50.7	20.0	19.4	1.30	23	23 25.6	21 43 28.27	4 29 43.1	31.4	30.4	2.04
10	2 54.5	22 15 31.13	− 9 38 26.6	20.3	19.7	1.32	24	23 19.7	21 41 31.63	− 4 42 32.5	31.3	30.2	2.02
11	2 52.6	22 17 27.41	9 16 15.2	20.7	20.0	1.34	25	23 14.0	21 39 42.12	4 55 35.1	31.0	30.0	2.01
12	2 50.6	22 19 17.52	8 54 18.3	21.0	20.3	1.36	26	23 8.3	21 38 0.30	5 8 46.0	30.7	29.7	1.99
13	2 48.4	22 21 1.26	8 32 37.7	21.4	20.7	1.38	27	23 2.8	21 36 26.69	5 22 0.3	30.4	29.4	1.97
14	2 46.1	22 22 36.45	8 11 15.2	21.7	21.0	1.40	28	22 57.5	21 35 1.70	5 35 13.4	30.1	29.1	1.95
15	2 43.7	22 24 8.90	− 7 50 12.6	22.0	21.3	1.42	Mar. 1	22 52.3	21 33 45.67	− 5 48 21.1	29.8	28.8	1.93
16	2 41.1	22 25 32.40	7 29 31.8	22.4	21.6	1.44	2	22 47.2	21 32 38.87	6 1 19.3	29.4	28.4	1.91
17	2 38.3	22 26 48.74	7 9 14.8	22.7	21.9	1.46	3	22 42.3	21 31 41.53	6 14 4.3	29.1	28.1	1.88
18	2 35.5	22 27 57.72	6 49 23.9	23.1	22.3	1.49	4	22 37.6	21 30 53.78	6 26 32.6	28.7	27.7	1.86
19	2 32.6	22 28 59.14	6 30 1.2	23.5	22.6	1.51	5	22 33.1	21 30 15.72	6 38 41.0	28.3	27.3	1.84
20	2 29.6	22 29 52.79	− 6 11 8.6	23.8	23.0	1.54	6	22 28.7	21 29 47.37	− 6 50 26.7	27.9	26.9	1.81
21	2 26.4	22 30 38.48	5 52 48.2	24.2	23.4	1.56	7	22 24.4	21 29 28.70	7 1 47.1	27.5	26.6	1.79
22	2 23.0	22 31 16.02	5 35 2.4	24.6	23.8	1.58	8	22 20.4	21 29 19.67	7 12 40.0	27.1	26.2	1.76
23	2 19.6	22 31 45.25	5 17 53.6	25.0	24.1	1.61	9	22 16.5	21 29 20.19	7 23 3.1	26.7	25.8	1.74
24	2 16.0	22 32 5.99	5 1 24.2	25.4	24.5	1.63	10	22 12.8	21 29 30.13	7 32 54.7	26.3	25.4	1.71
25	2 12.3	22 32 18.10	− 4 45 36.5	25.8	24.9	1.66	11	22 9.2	21 29 49.36	− 7 42 13.2	25.9	25.0	1.69
26	2 8.4	22 32 21.43	4 30 33.0	26.2	25.3	1.68	12	22 5.7	21 30 17.69	7 50 57.1	25.5	24.6	1.66
27	2 4.4	22 32 15.86	4 16 16.1	26.6	25.7	1.71	13	22 2.3	21 30 54.92	7 59 5.2	25.0	24.2	1.64
28	2 0.2	22 32 1.29	4 2 48.3	27.0	26.0	1.73	14	21 59.1	21 31 40.84	8 6 36.6	24.6	23.8	1.61
29	1 55.9	22 31 37.64	3 50 12.2	27.4	26.4	1.76	15	21 56.1	21 32 35.23	8 13 30.4	24.2	23.4	1.58
30	1 51.4	22 31 4.89	− 3 38 30.4	27.8	26.8	1.78	16	21 53.2	21 33 37.84	− 8 19 45.7	23.9	23.1	1.56
31	1 46.8	22 30 23.04	3 27 45.2	28.1	27.2	1.81	17	21 50.4	21 34 48.45	8 25 21.6	23.5	22.7	1.53
Feb. 1	1 42 0	22 29 32.10	3 17 58.8	28.5	27.5	1.83	18	21 47.8	21 36 6.80	8 30 17.9	23.1	22.4	1.51
2	1 37.1	22 28 32.14	3 9 13.4	28.9	27.9	1.86	19	21 45.3	21 37 32.64	8 34 34.4	22.8	22.0	1.48
3	1 32.1	22 27 23.29	3 1 31.3	29.2	28.2	1.88	20	21 42.9	21 39 5.71	8 38 10.6	22.4	21.6	1.46
4	1 26.9	22 26 5.72	− 2 54 54.5	29.6	28.6	1.91	21	21 40.6	21 40 45.75	− 8 41 6.4	22.0	21.3	1.44
5	1 21.5	22 24 39.66	2 49 24.7	29.9	28.9	1.93	22	21 38.5	21 42 32.50	8 43 21.8	21.7	20.9	1.41
6	1 15.9	22 23 5 41	2 45 3.5	30.2	29.2	1.95	23	21 36.5	21 44 25.69	8 44 56.7	21.3	20.6	1.39
7	1 10.3	22 21 23.34	2 41 52.1	30.5	29.5	1.96	24	21 34.5	21 46 25.06	8 45 51.1	21.0	20.2	1.37
8	1 4.5	22 19 33.88	2 39 51.4	30.9	29.7	1.98	25	21 32.6	21 48 30.36	8 46 5.3	20.6	19.9	1.35
9	0 58.6	22 17 37.52	− 2 39 1.8	31.2	30.0	2.00	26	21 30.8	21 50 41.33	− 8 45 30.5	20.3	19.6	1.33
10	0 52.6	22 15 34.85	2 39 23.3	31.4	30.3	2.02	27	21 29.2	21 52 57.70	8 44 34.0	20.0	19.3	1.30
11	0 46.5	22 13 26.52	2 40 55.4	31.6	30.5	2.03	28	21 27.6	21 55 19.24	8 42 49.2	19.7	19.0	1.28
12	0 40.4	22 11 13.24	2 43 37.4	31.8	30.7	2.05	29	21 26.1	21 57 45.73	8 40 25.2	19.4	18.7	1.26
13	0 34.2	22 8 55.81	2 47 27.8	31.9	30.8	2.06	30	21 24.7	22 0 16.92	8 37 22.6	19.1	18.4	1.24
14	0 28.0	22 6 35.06	− 2 52 24.5	32.1	31.0	2.07	31	21 23.3	22 2 52.60	− 8 33 41.7	18.8	18.1	1.22
15	0 21.7	22 4 11.84	− 2 58 24.9	32.2	31.1	2.08	32	21 22.1	22 5 32.55	− 8 29 23.0	18.5	17.8	1.21

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	21 22.1	22 5 32.55	− 8 29 23.0	18.5	17.8	1.21	May 17	21 3.7	0 48 25.46	+ 3 17 26.8	10.6	10.2	0.68
2	21 20.9	22 8 16.55	8 24 27.1	18.2	17.5	1.19	18	21 3.7	0 52 25.71	3 39 37.9	10.5	10.1	0.67
3	21 19.8	22 11 4.40	8 18 54.4	17.9	17.3	1.17	19	21 3.8	0 56 26.79	4 1 55.1	10.4	10.0	0.67
4	21 18.7	22 13 55.93	8 12 45.4	17.6	17.0	1.15	20	21 3.9	1 0 28.70	4 24 17.9	10.3	9.9	0.66
5	21 17.7	22 16 50.95	8 6 0.7	17.4	16.8	1.13	21	21 4.0	1 4 31.45	4 46 45.4	10.2	9.8	0.66
6	21 16.7	22 19 49.29	− 7 58 40.8	17.1	16.6	1.12	22	21 4.1	1 8 35.06	+ 5 9 16.9	10.1	9.7	0.65
7	21 15.8	22 22 50.78	7 50 46.4	16.9	16.3	1.10	23	21 4.2	1 12 39.52	5 31 51.8	10.0	9.6	0.65
8	21 14.9	22 25 55.28	7 42 17.9	16.6	16.1	1.08	24	21 4.4	1 16 44.84	5 54 29.3	9.9	9.6	0.64
9	21 14.1	22 29 2.64	7 33 15.9	16.4	15.8	1.07	25	21 4.5	1 20 51.04	6 17 8.6	9.8	9.5	0.64
10	21 13.4	22 32 12.71	7 23 41.0	16.2	15.6	1.05	26	21 4.7	1 24 58.11	6 39 49.0	9.7	9.4	0.63
11	21 12.7	22 35 25.37	− 7 13 33.7	16.0	15.4	1.04	27	21 4.9	1 29 6.06	+ 7 2 29.7	9.6	9.3	0.63
12	21 12.0	22 38 40.52	7 2 54.6	15.8	15.2	1.02	28	21 5.1	1 33 14.91	7 25 10.0	9.6	9.2	0.62
13	21 11.3	22 41 58.02	6 51 44.4	15.5	15.0	1.00	29	21 5.3	1 37 24.66	7 47 49.3	9.5	9.2	0.62
14	21 10.7	22 45 17.77	6 40 3.7	15.3	14.8	0.99	30	21 5.5	1 41 35.32	8 10 26.8	9.4	9.1	0.61
15	21 10.1	22 48 39.66	6 27 52.9	15.1	14.6	0.98	31	21 5.8	1 45 46.90	8 33 1.7	9.3	9.0	0.61
16	21 9.5	22 52 3.59	− 6 15 12.8	14.9	14.4	0.97	June 1	21 6.1	1 49 59.41	+ 8 55 33.3	9.2	8.9	0.60
17	21 9.0	22 55 29.48	6 2 4.1	14.7	14.2	0.95	2	21 6.4	1 54 12.87	9 18 0.9	9.2	8.9	0.60
18	21 8.5	22 58 57.24	5 48 27.1	14.5	14.0	0.94	3	21 6.7	1 58 27.27	9 40 23.7	9.1	8.8	0.59
19	21 8.1	23 2 26.80	5 34 22.6	14.3	13.8	0.93	4	21 7.0	2 2 42.64	10 2 41.0	9.0	8.7	0.59
20	21 7.7	23 5 58.05	5 19 51.5	14.2	13.7	0.92	5	21 7.4	2 6 58.99	10 24 52.1	9.0	8.7	0.59
21	21 7.3	23 9 30.93	− 5 4 54.3	14.0	13.5	0.90	6	21 7.7	2 11 16.34	+10 46 56.2	8.9	8.6	0.58
22	21 6.9	23 13 5.36	4 49 31.6	13.8	13.3	0.89	7	21 8.1	2 15 34.70	11 8 52.7	8.8	8.5	0.58
23	21 6.5	23 16 41.27	4 33 44.3	13.6	13.2	0.88	8	21 8.5	2 19 54.10	11 30 40.8	8.8	8.5	0.58
24	21 6.2	23 20 18.59	4 17 32.9	13.5	13.0	0.87	9	21 8.9	2 24 14.54	11 52 19.9	8.7	8.4	0.57
25	21 5.9	23 23 57.27	4 0 58.3	13.3	12.9	0.86	10	21 9.3	2 28 36.05	12 13 49.3	8.6	8.3	0.57
26	21 5.6	23 27 37.24	− 3 44 1.0	13.2	12.8	0.85	11	21 9.7	2 32 58.64	+12 35 8.1	8.5	8.3	0.57
27	21 5.4	23 31 18.45	3 26 41.9	13.0	12.6	0.84	12	21 10.1	2 37 22.33	12 56 15.8	8.5	8.2	0.56
28	21 5.2	23 35 0.83	3 9 1.7	12.9	12.4	0.83	13	21 10.6	2 41 47.14	13 17 11.6	8.4	8.2	0.56
29	21 5.0	23 38 44.33	2 51 1.1	12.7	12.3	0.82	14	21 11.1	2 46 13.08	13 37 54.8	8.4	8.1	0.56
30	21 4.8	23 42 28.90	2 32 40.8	12.6	12.1	0.81	15	21 11.6	2 50 40.16	13 58 24.6	8.3	8.1	0.55
May 1	21 4.6	23 46 14.51	− 2 14 1.7	12.4	12.0	0.80	16	21 12.1	2 55 8.41	+14 18 40.4	8.3	8.0	0.55
2	21 4.5	23 50 1.12	1 55 4.5	12.3	11.9	0.79	17	21 12.7	2 59 37.83	14 38 41.5	8.2	8.0	0.55
3	21 4.3	23 53 48.70	1 35 49.8	12.1	11.8	0.78	18	21 13.2	3 4 8.44	14 58 27.1	8.2	7.9	0.54
4	21 4.2	23 57 37.22	1 16 18.4	12.0	11.6	0.77	19	21 13.8	3 8 40.25	15 17 56.6	8.1	7.8	0.54
5	21 4.1	0 1 26.64	0 56 31.1	11.9	11.5	0.77	20	21 14.4	3 13 13.27	15 37 9.2	8.1	7.8	0.54
6	21 4.0	0 5 16.96	− 0 36 28.5	11.8	11.4	0.76	21	21 15.0	3 17 47.50	+15 56 4.1	8.0	7.7	0.54
7	21 3.9	0 9 8.14	− 0 16 11.4	11.7	11.2	0.75	22	21 15.6	3 22 22.94	16 14 40.7	8.0	7.7	0.53
8	21 3.8	0 13 0.17	+ 0 4 19.6	11.5	11.1	0.74	23	21 16.3	3 26 59.60	16 32 58.3	7.9	7.6	0.53
9	21 3.8	0 16 53.03	0 25 3.8	11.4	11.0	0.74	24	21 17.0	3 31 37.47	16 50 56.1	7.9	7.6	0.53
10	21 3.7	0 20 46.73	0 46 0.4	11.3	10.9	0.73	25	21 17.7	3 36 16.57	17 8 33.4	7.8	7.5	0.53
11	21 3.7	0 24 41.24	+ 1 7 8.8	11.2	10.8	0.72	26	21 18.5	3 40 56.89	+17 25 49.6	7.8	7.5	0.52
12	21 3.6	0 28 36.57	1 28 28.2	11.1	10.7	0.71	27	21 19.3	3 45 38.41	17 42 44.0	7.7	7.4	0.52
13	21 3.6	0 32 32.71	1 49 58.0	11.0	10.6	0.71	28	21 20.0	3 50 21.15	17 59 15.7	7.7	7.4	0.52
14	21 3.6	0 36 29.67	2 11 37.5	10.9	10.5	0.70	29	21 20.8	3 55 5.09	18 15 24.2	7.6	7.4	0.52
15	21 3.6	0 40 27.45	2 33 25.9	10.8	10.4	0.69	30	21 21.6	3 59 50.21	18 31 8.7	7.6	7.3	0.51
16	21 3.6	0 44 26.04	+ 2 55 22.6	10.7	10.3	0.69	31	21 22.4	4 4 36.52	+18 46 28.6	7.5	7.3	0.51
17	21 3.7	0 48 25.46	+ 3 17 26.8	10.6	10.2	0.68	32	21 23.2	4 9 23.99	+19 1 23.2	7.5	7.2	0.51

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
July 1	21 22.4	4 4 36.52	+18 46 28.6	7.5	7.3	0.51
2	21 23.2	4 9 23.99	19 1 23.2	7.5	7.2	0.51
3	21 24.1	4 14 12.61	19 15 51.8	7.4	7.2	0.51
4	21 25.0	4 19 2.37	19 29 53.8	7.4	7.2	0.50
5	21 25.9	4 23 53.28	19 43 28.5	7.4	7.1	0.50
6	21 26.8	4 28 45.31	+19 56 35.4	7.3	7.1	0.50
7	21 27.8	4 33 38.44	20 9 13.9	7.3	7.1	0.50
8	21 28.7	4 38 32.64	20 21 23.3	7.2	7.0	0.50
9	21 29.7	4 43 27.91	20 33 3.1	7.2	7.0	0.50
10	21 30.7	4 48 24.22	20 44 12.6	7.2	6.9	0.49
11	21 31.7	4 53 21.55	+20 54 51.3	7.1	6.9	0.49
12	21 32.7	4 58 19.88	21 4 58.6	7.1	6.9	0.49
13	21 33.8	5 3 19.19	21 14 34.1	7.0	6.8	0.49
14	21 34.8	5 8 19.44	21 23 37.2	7.0	6.8	0.49
15	21 35.9	5 13 20.60	21 32 7.5	7.0	6.7	0.48
16	21 37.0	5 18 22.64	+21 40 4.5	6.9	6.7	0.48
17	21 38.1	5 23 25.54	21 47 27.6	6.9	6.7	0.48
18	21 39.2	5 28 29.25	21 54 16.5	6.9	6.6	0.48
19	21 40.3	5 33 33.75	22 0 30.7	6.8	6.6	0.48
20	21 41.4	5 38 38.99	22 6 9.9	6.8	6.6	0.47
21	21 42.6	5 43 44.93	+22 11 13.6	6.8	6.6	0.47
22	21 43.8	5 48 51.52	22 15 41.6	6.7	6.5	0.47
23	21 45.0	5 53 58.72	22 19 33.4	6.7	6.5	0.47
24	21 46.2	5 59 6.48	22 22 48.8	6.7	6.5	0.47
25	21 47.4	6 4 14.75	22 25 27.5	6.7	6.4	0.46
26	21 48.6	6 9 23.49	+22 27 29.3	6.6	6.4	0.46
27	21 49.8	6 14 32.63	22 28 53.8	6.6	6.3	0.46
28	21 51.0	6 19 42.14	22 29 40.9	6.6	6.3	0.46
29	21 52.2	6 24 51.96	22 29 50.5	6.5	6.3	0.46
30	21 53.4	6 30 2.04	22 29 22.4	6.5	6.3	0.45
31	21 54.7	6 35 12.32	+22 28 16.3	6.5	6.2	0.45
Aug. 1	21 55.9	6 40 22.75	22 26 32.2	6.4	6.2	0.45
2	21 57.1	6 45 33.28	22 24 10.1	6.4	6.2	0.45
3	21 58.3	6 50 43.87	22 21 9.9	6.4	6.2	0.45
4	21 59.6	6 55 54.46	22 17 31.7	6.4	6.2	0.44
5	22 0.8	7 1 5.01	+22 13 15.4	6.3	6.1	0.44
6	22 2.0	7 6 15.47	22 8 20.9	6.3	6.1	0.44
7	22 3.2	7 11 25.78	22 2 48.5	6.3	6.1	0.44
8	22 4.5	7 16 35.89	21 56 38.2	6.3	6.1	0.44
9	22 5.7	7 21 45.76	21 49 50.2	6.3	6.0	0.43
10	22 6.9	7 26 55.35	+21 42 24.6	6.2	6.0	0.43
11	22 8.1	7 32 4.61	21 34 21.6	6.2	6.0	0.43
12	22 9.4	7 37 13.52	21 25 41.3	6.2	6.0	0.43
13	22 10.6	7 42 22.03	21 16 24.0	6.2	6.0	0.43
14	22 11.8	7 47 30.12	21 6 29.8	6.2	5.9	0.43
15	22 12.9	7 52 37.73	+20 55 59.2	6.1	5.9	0.42
16	22 14.0	7 57 44.82	+20 44 52.4	6.1	5.9	0.42
Aug. 16	22 14.0	7 57 44.82	+20 44 52.4	6.1	5.9	0.42
17	22 15.2	8 2 51.38	20 33 9.6	6.1	5.9	0.42
18	22 16.3	8 7 57.36	20 20 51.2	6.1	5.9	0.42
19	22 17.5	8 13 2.72	20 7 57.6	6.0	5.8	0.42
20	22 18.6	8 18 7.45	19 54 29.2	6.0	5.8	0.41
21	22 19.7	8 23 11.51	+19 40 26.4	6.0	5.8	0.41
22	22 20.8	8 28 14.86	19 25 49.8	6.0	5.8	0.41
23	22 21.9	8 33 17.49	19 10 39.5	6.0	5.8	0.41
24	22 23.0	8 38 19.38	18 54 56.2	5.9	5.7	0.41
25	22 24.1	8 43 20.49	18 38 40.2	5.9	5.7	0.40
26	22 25.1	8 48 20.81	+18 21 52.2	5.9	5.7	0.40
27	22 26.2	8 53 20.32	18 4 32.6	5.9	5.7	0.40
28	22 27.2	8 58 19.01	17 46 42.0	5.9	5.7	0.40
29	22 28.2	9 3 16.86	17 28 20.9	5.9	5.7	0.40
30	22 29.2	9 8 13.86	17 9 29.8	5.8	5.6	0.40
31	22 30.2	9 13 9.99	+16 50 9.4	5.8	5.6	0.39
Sept. 1	22 31.2	9 18 5.25	16 30 20.3	5.8	5.6	0.39
2	22 32.2	9 22 59.64	16 10 3.0	5.8	5.6	0.39
3	22 33.1	9 27 53.15	15 49 18.2	5.8	5.6	0.39
4	22 34.1	9 32 45.78	15 28 6.5	5.8	5.6	0.39
5	22 35.0	9 37 37.53	+15 6 28.3	5.7	5.5	0.38
6	22 35.9	9 42 28.41	14 44 24.4	5.7	5.5	0.38
7	22 36.8	9 47 18.44	14 21 55.5	5.7	5.5	0.38
8	22 37.7	9 52 7.63	13 59 2.2	5.7	5.5	0.38
9	22 38.5	9 56 55.98	13 35 45.2	5.7	5.5	0.38
10	22 39.4	10 1 43.49	+13 12 5.1	5.7	5.5	0.38
11	22 40.2	10 6 30.18	12 48 2.4	5.7	5.5	0.37
12	22 41.1	10 11 16.08	12 23 37.9	5.6	5.5	0.37
13	22 41.9	10 16 1.21	11 58 52.3	5.6	5.4	0.37
14	22 42.7	10 20 45.59	11 33 46.3	5.6	5.4	0.37
15	22 43.5	10 25 29.24	+11 8 20.5	5.6	5.4	0.37
16	22 44.3	10 30 12.18	10 42 35.5	5.6	5.4	0.37
17	22 45.0	10 34 54.43	10 16 32.2	5.6	5.4	0.37
18	22 45.7	10 39 36.02	9 50 11.1	5.6	5.4	0.36
19	22 46.4	10 44 16.97	9 23 33.1	5.6	5.4	0.36
20	22 47.1	10 48 57.29	+ 8 56 38.8	5.5	5.4	0.36
21	22 47.8	10 53 37.03	8 29 28.9	5.5	5.3	0.36
22	22 48.5	10 58 16.21	8 2 4.0	5.5	5.3	0.36
23	22 49.2	11 2 54.86	7 34 24.9	5.5	5.3	0.36
24	22 49.9	11 7 33.00	7 6 32.4	5.5	5.3	0.36
25	22 50.6	11 12 10.66	+ 6 38 27.1	5.5	5.3	0.36
26	22 51.3	11 16 47.89	6 10 9.9	5.5	5.3	0.35
27	22 52.0	11 21 24.70	5 41 41.4	5.5	5.3	0.35
28	22 52.7	11 26 1.12	5 13 2.3	5.5	5.3	0.35
29	22 53.3	11 30 37.19	4 44 13.5	5.5	5.3	0.35
30	22 54.0	11 35 12.93	+ 4 15 15.6	5.4	5.3	0.35
31	22 54.6	11 39 48.40	+ 3 46 9.3	5.4	5.3	0.35

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	22 54.6	11 39 48.40	+ 3 46 9.3	5.4	5.3	0.35	Nov. 16	23 30.4	15 17 0.65	−17 27 41.5	5.2	5.0	0.35
2	22 55.3	11 44 23.61	3 16 55.4	5.4	5.2	0.35	17	23 31.5	15 22 4.57	17 49 5.8	5.2	5.0	0.35
3	22 55.9	11 48 58.62	2 47 34.7	5.4	5.2	0.35	18	23 32.6	15 27 9.74	18 10 1.4	5.2	5.0	0.35
4	22 56.6	11 53 33.45	2 18 7.7	5.4	5.2	0.35	19	23 33.8	15 32 16.15	18 30 27.4	5.2	5.0	0.35
5	22 57.2	11 58 8.15	1 48 35.3	5.4	5.2	0.35	20	23 35.0	15 37 23.80	18 50 23.1	5.2	5.0	0.35
6	22 57.8	12 2 42.76	+ 1 18 58.2	5.4	5.2	0.35	21	23 36.2	15 42 32.69	−19 9 47.8	5.2	5.0	0.35
7	22 58.4	12 7 17.30	0 49 17.2	5.4	5.2	0.35	22	23 37.4	15 47 42.80	19 28 40.7	5.2	5.0	0.35
8	22 59.1	12 11 51.83	+ 0 19 32.9	5.4	5.2	0.35	23	23 38.6	15 52 54.09	19 47 1.0	5.2	5.0	0.35
9	22 59.7	12 16 26.38	− 0 10 13.9	5.4	5.2	0.34	24	23 39.9	15 58 6.59	20 4 48.0	5.2	5.0	0.35
10	23 0.3	12 21 1.00	0 40 2.6	5.4	5.2	0.34	25	23 41.2	16 3 20.29	20 22 0.9	5.2	5.0	0.35
11	23 0.9	12 25 35.74	− 1 9 52.4	5.3	5.2	0.34	26	23 42.5	16 8 35.16	−20 38 38.9	5.2	5.0	0.36
12	23 1.5	12 30 10.64	1 39 42.4	5.3	5.2	0.34	27	23 43.8	16 13 51.17	20 54 41.4	5.2	5.0	0.36
13	23 2.2	12 34 45.72	2 9 32.0	5.3	5.2	0.34	28	23 45.2	16 19 8.30	21 10 7.9	5.2	5.0	0.36
14	23 2.8	12 39 21.05	2 39 20.5	5.3	5.1	0.34	29	23 46.5	16 24 26.51	21 24 57.7	5.2	5.0	0.36
15	23 3.5	12 43 56.65	3 9 7.0	5.3	5.1	0.34	30	23 47.9	16 29 45.79	21 39 10.1	5.2	5.0	0.36
16	23 4.1	12 48 32.56	− 3 38 50.9	5.3	5.1	0.34	Dec. 1	23 49.3	16 35 6.09	−21 52 44.3	5.2	5.0	0.36
17	23 4.8	12 53 8.84	4 8 31.3	5.3	5.1	0.34	2	23 50.7	16 40 27.38	22 5 39.9	5.2	5.0	0.36
18	23 5.5	12 57 45.52	4 38 7.5	5.3	5.1	0.34	3	23 52.1	16 45 49.62	22 17 56.2	5.2	5.0	0.36
19	23 6.2	13 2 22.64	5 7 38.9	5.3	5.1	0.34	4	23 53.6	16 51 12.79	22 29 32.6	5.2	5.0	0.36
20	23 6.9	13 7 0.24	5 37 4.7	5.3	5.1	0.34	5	23 55.0	16 56 36.84	22 40 28.7	5.2	5.0	0.36
21	23 7.5	13 11 38.36	− 6 6 24.0	5.3	5.1	0.34	6	23 56.5	17 2 1.72	−22 50 43.9	5.2	5.0	0.36
22	23 8.2	13 16 17.04	6 35 36.0	5.3	5.1	0.34	7	23 57.9	17 7 27.39	23 0 17.8	5.2	5.0	0.36
23	23 8.9	13 20 56.30	7 4 40.0	5.3	5.1	0.34	8	23 59.4	17 12 53.79	23 9 9.8	5.2	5.0	0.36
24	23 9.6	13 25 36.20	7 33 35.2	5.3	5.1	0.34	10	0 0.9	17 18 20.87	23 17 19.6	5.2	5.0	0.36
25	23 10.4	13 30 16.76	8 2 20.8	5.3	5.1	0.34	11	0 2.4	17 23 48.60	23 24 46.8	5.2	5.0	0.36
26	23 11.2	13 34 58.03	− 8 30 56.1	5.3	5.1	0.34	12	0 3.9	17 29 16.92	−23 31 31.1	5.2	5.0	0.36
27	23 12.0	13 39 40.03	8 59 20.2	5.3	5.1	0.34	13	0 5.5	17 34 45.77	23 37 32.1	5.2	5.0	0.36
28	23 12.7	13 44 22.80	9 27 32.4	5.2	5.1	0.34	14	0 7.0	17 40 15.10	23 42 49.5	5.2	5.0	0.36
29	23 13.5	13 49 6.37	9 55 31.8	5.2	5.1	0.34	15	0 8.6	17 45 44.86	23 47 23.1	5.2	5.0	0.36
30	23 14.3	13 53 50.77	10 23 17.7	5.2	5.1	0.34	16	0 10.1	17 51 14.97	23 51 12.6	5.2	5.0	0.36
31	23 15.1	13 58 36.04	−10 50 49.2	5.2	5.1	0.34	17	0 11.7	17 56 45.38	−23 54 17.7	5.2	5.0	0.36
Nov. 1	23 15.9	14 3 22.20	11 18 5.4	5.2	5.1	0.34	18	0 13.2	18 2 16.01	23 56 38.3	5.2	5.0	0.37
2	23 16.8	14 8 9.29	11 45 5.7	5.2	5.0	0.34	19	0 14.8	18 7 46.81	23 58 14.4	5.2	5.0	0.37
3	23 17.6	14 12 57.34	12 11 49.2	5.2	5.0	0.34	20	0 16.3	18 13 17.71	23 59 5.7	5.2	5.0	0.37
4	23 18.5	14 17 46.37	12 38 15.0	5.2	5.0	0.34	21	0 17.9	18 18 48.65	23 59 12.3	5.2	5.0	0.37
5	23 19.4	14 22 36.42	−13 4 22.5	5.2	5.0	0.34	22	0 19.5	18 24 19.56	−23 58 34.1	5.2	5.0	0.37
6	23 20.3	14 27 27.50	13 30 10.8	5.2	5.0	0.34	23	0 21.1	18 29 50.37	23 57 11.0	5.2	5.0	0.37
7	23 21.2	14 32 19.64	13 55 39.1	5.2	5.0	0.35	24	0 22.6	18 35 21.03	23 55 3.2	5.2	5.0	0.37
8	23 22.1	14 37 12.87	14 20 46.6	5.2	5.0	0.35	25	0 24.2	18 40 51.45	23 52 10.7	5.2	5.0	0.37
9	23 23.1	14 42 7.23	14 45 32.5	5.2	5.0	0.35	26	0 25.8	18 46 21.57	23 48 33.7	5.2	5.0	0.37
10	23 24.1	14 47 2.72	−15 9 56.0	5.2	5.0	0.35	27	0 27.4	18 51 51.33	−23 44 12.3	5.2	5.0	0.37
11	23 25.1	14 51 59.38	15 33 56.2	5.2	5.0	0.35	28	0 29.0	18 57 20.65	23 39 6.7	5.2	5.0	0.37
12	23 26.1	14 56 57.22	15 57 32.5	5.2	5.0	0.35	29	0 30.5	19 2 49.47	23 33 16.9	5.2	5.0	0.37
13	23 27.1	15 1 56.26	16 20 44.0	5.2	5.0	0.35	30	0 32.0	19 8 17.74	23 26 43.4	5.2	5.0	0.37
14	23 28.2	15 6 56.51	16 43 29.8	5.2	5.0	0.35	31	0 33.5	19 13 45.39	23 19 26.4	5.2	5.0	0.37
15	23 29.3	15 11 57.97	−17 5 49.2	5.2	5.0	0.35	32	0 35.0	19 19 12.37	−23 11 26.3	5.2	5.0	0.37
16	23 30.4	15 17 0.65	−17 27 41.5	5.2	5.0	0.35	33	0 36.5	19 24 38.61	−23 2 43.4	5 2	5.0	0.37

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 1	16 48.0	11 35 53.58	+5 48 35.2	8.4	4.8	0.32	Feb. 16	13 48.4	11 37 4.73	+ 6 55 13.3	12.4	7.0	0.47
2	16 45.0	11 36 49.13	5 44 20.5	8.5	4.8	0.32	17	13 43.4	11 36 2.11	7 2 44.0	12.4	7.1	0.48
3	16 42.0	11 37 42.81	5 40 18.3	8.6	4.9	0.33	18	13 38.4	11 34 57.04	7 10 25.3	12.5	7.1	0.48
4	16 38.9	11 38 34.56	5 36 28.8	8.6	4.9	0.33	19	13 33.3	11 33 49.57	7 18 16.6	12.6	7.2	0.48
5	16 35.8	11 39 24.37	5 32 52.4	8.7	5.0	0.33	20	13 28.2	11 32 39.77	7 26 17.1	12.6	7.2	0.49
6	16 32.7	11 40 12.20	+5 29 29.1	8.8	5.0	0.34	21	13 23.1	11 31 27.75	+ 7 34 26.0	12.7	7.2	0.49
7	16 29.5	11 40 57.99	5 26 19.4	8.9	5.1	0.34	22	13 17.9	11 30 13.62	7 42 42.3	12.7	7.3	0.49
8	16 26.3	11 41 41.71	5 23 23.3	8.9	5.1	0.34	23	13 12.7	11 28 57.48	7 51 5.2	12.8	7.3	0.49
9	16 23.1	11 42 23.34	5 20 41.2	9.0	5.1	0.35	24	13 7.5	11 27 39.44	7 59 33.7	12.8	7.3	0.49
10	16 19.8	11 43 2.83	5 18 13.2	9.1	5.2	0.35	25	13 2.3	11 26 19.61	8 8 7.0	12.9	7.4	0.50
11	16 16.5	11 43 40.14	+5 15 59.5	9.2	5.2	0.36	26	12 57.0	11 24 58.12	+ 8 16 44.0	12.9	7.4	0.50
12	16 13.1	11 44 15.25	5 14 0.5	9.2	5.3	0.36	27	12 51.7	11 23 35.10	8 25 23.5	13.0	7.4	0.50
13	16 9.7	11 44 48.12	5 12 16.2	9.3	5.3	0.36	28	12 46.3	11 22 10.71	8 34 4.6	13.0	7.4	0.50
14	16 6.3	11 45 18.69	5 10 46.9	9.4	5.4	0.37	Mar. 1	12 41.0	11 20 45.10	8 42 46.2	13.1	7.5	0.50
15	16 2.9	11 45 46.95	5 9 32.8	9.5	5.4	0.37	2	12 35.6	11 19 18.41	8 51 27.3	13.1	7.5	0.51
16	15 59.4	11 46 12.85	+5 8 34.2	9.6	5.5	0.37	3	12 30.2	11 17 50.82	+ 9 0 6.7	13.1	7.5	0.51
17	15 55.8	11 46 36.35	5 7 51.1	9.6	5.5	0.38	4	12 24.8	11 16 22.49	9 8 43.1	13.1	7.5	0.51
18	15 52.2	11 46 57.41	5 7 23.9	9.7	5.6	0.38	5	12 19.4	11 14 53.59	9 17 15.5	13.1	7.5	0.51
19	15 48.6	11 47 15.99	5 7 12.8	9.8	5.6	0.38	6	12 14.0	11 13 24.29	9 25 42.9	13.1	7.5	0.51
20	15 45.0	11 47 32.04	5 7 17.8	9.9	5.7	0.39	7	12 8.6	11 11 54.78	9 34 4.2	13.2	7.5	0.51
21	15 41.3	11 47 45.53	+5 7 39.3	10.0	5.7	0.39	8	12 3.1	11 10 25.22	+ 9 42 18.3	13.2	7.5	0.51
22	15 37.5	11 47 56.41	5 8 17.4	10.1	5.8	0.39	9	11 57.7	11 8 55.79	9 50 24.3	13.2	7.5	0.51
23	15 33.7	11 48 4.64	5 9 12.2	10.2	5.8	0.40	10	11 52.3	11 7 26.66	9 58 21.0	13.2	7.5	0.51
24	15 29.8	11 48 10.17	5 10 24.0	10.3	5.9	0.40	11	11 46.9	11 5 58.00	10 6 7.6	13.2	7.5	0.51
25	15 26.0	11 48 12.97	5 11 52.9	10.4	5.9	0.40	12	11 41.5	11 4 30.00	10 13 43.2	13.2	7.5	0.51
26	15 22.0	11 48 13.00	+5 13 39.0	10.5	6.0	0.41	13	11 36.1	11 3 2.80	+10 21 7.0	13.1	7.5	0.51
27	15 18.0	11 48 10.23	5 15 42.4	10.6	6.0	0.41	14	11 30.8	11 1 36.55	10 28 18.1	13.1	7.5	0.51
28	15 14.0	11 48 4.62	5 18 3.2	10.7	6.1	0.41	15	11 25.4	11 0 11.42	10 35 15.9	13.1	7.5	0,51
29	15 10.0	11 47 56.13	5 20 41.4	10.8	6.2	0.42	16	11 20.1	10 58 47.54	10 41 59.7	13.0	7.4	0.51
30	15 5.9	11 47 44.75	5 23 37.0	10.9	6.2	0.42	17	11 14.8	10 57 25.06	10 48 28.8	13.0	7.4	0.51
31	15 1.7	11 47 30.45	+5 26 50.0	11.0	6.3	0.42	18	11 9.5	10 56 4.11	+10 54 42.7	13.0	7.4	0.50
Feb. 1	14 57.5	11 47 13.20	5 30 20.5	11.1	6.3	0.43	19	11 4.3	10 54 44.82	11 0 40.9	12.9	7.4	0.50
2	14 53.2	11 46 53.00	5 34 8.3	11.2	6.4	0.43	20	10 59.0	10 53 27.33	11 6 22.8	12.9	7.4	0.50
3	14 48.9	11 46 29.83	5 38 13.3	11.2	6.4	0.43	21	10 53.8	10 52 11.74	11 11 48.1	12.9	7.3	0.50
4	14 44.5	11 46 3.69	5 42 35.3	11.3	6.5	0.44	22	10 48.7	10 50 58.15	11 16 56.2	12.8	7.3	0.50
5	14 40.1	11 45 34.59	+5 47 14.1	11.4	6.5	0.44	23	10 43.6	10 49 46.68	+11 21 47.1	12.8	7.3	0.50
6	14 35.6	11 45 2.54	5 52 9.5	11.5	6.6	0.44	24	10 38.5	10 48 37.42	11 26 20.4	12.7	7.3	0.50
7	14 31.1	11 44 27.54	5 57 21.1	11.6	6.6	0.45	25	10 33.4	10 47 30.47	11 30 35.7	12.6	7.2	0.49
8	14 26.5	11 43 49.62	6 2 48.7	11.7	6.7	0.45	26	10 28.4	10 46 25.92	11 34 32.8	12.6	7.2	0.49
9	14 21.9	11 43 8.80	6 8 31.8	11.8	6.7	0.46	27	10 23.4	10 45 23.86	11 38 11.5	12.5	7.1	0.49
10	14 17.3	11 42 25.09	+6 14 30.3	11.9	6.8	0.46	28	10 18.5	10 44 24.37	+11 41 31.7	12.4	7.1	0.49
11	14 12.6	11 41 38.55	6 20 43.6	12.0	6.8	0.46	29	10 13.7	10 43 27.51	11 44 33.4	12.3	7.0	0.48
12	14 7.8	11 40 49.20	6 27 11.1	12.0	6.9	0.46	30	10 8.9	10 42 33.34	11 47 16.3	12.3	7.0	0.48
13	14 3.0	11 39 57.10	6 33 52.4	12.1	6.9	0.47	31	10 4.1	10 41 41.93	11 49 40.6	12.2	6.9	0.47
14	13 58.2	11 39 2.29	6 40 46.9	12.2	7.0	0.47	32	9 59.3	10 40 53.33	11 51 46.1	12.2	6.9	0.47
15	13 53.3	11 38 4.81	+6 47 54.1	12.3	7.0	0.47	33	9 54.0	10 40 7.60	+11 53 32.9	12.1	6.9	0.47
16	13 48.4	11 37 4.73	+6 55 13.3	12.4	7.0	0.47	34	9 50.0	10 39 24.77	+11 55 1.0	12.0	6.9	0.47

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	9 59.3	10 40 53.33	+11 51 46.1	12.2	6.9	0.47	May 17	7 9.8	10 52 15.55	+8 46 20.4	8.5	4.9	0.33
2	9 54.6	10 40 7.60	11 53 32.9	12.1	6.9	0.47	18	7 7.0	10 53 21.31	8 37 35.8	8.5	4.8	0.33
3	9 50.0	10 39 24.77	11 55 1.0	12.0	6.9	0.47	19	7 4.2	10 54 28.60	8 28 42.4	8.4	4.8	0.32
4	9 45.4	10 38 44.85	11 56 10.7	11.9	6.8	0.46	20	7 1.4	10 55 37.39	8 19 40.2	8.4	4.8	0.32
5	9 40.9	10 38 7.89	11 57 1.8	11.8	6.8	0.46	21	6 58.6	10 56 47.64	8 10 29.5	8.3	4.7	0.32
6	9 36.4	10 37 33.90	+11 57 34.7	11.8	6.7	0.46	22	6 55.9	10 57 59.32	+8 1 10.3	8.2	4.7	0.32
7	9 31.9	10 37 2.91	11 57 49.3	11.7	6.7	0.45	23	6 53.2	10 59 12.41	7 51 42.8	8.2	4.7	0.31
8	9 27.5	10 36 34.91	11 57 46.0	11.6	6.6	0.45	24	6 50.5	11 0 26.88	7 42 7.0	8.1	4.6	0.31
9	9 23.2	10 36 9.89	11 57 25.0	11.5	6.6	0.45	25	6 47.8	11 1 42.70	7 32 23.2	8.0	4.6	0.31
10	9 18.9	10 35 47.85	11 56 46.6	11.4	6.5	0.45	26	6 45.1	11 2 59.83	7 22 31.4	8.0	4.6	0.31
11	9 14.6	10 35 28.78	+11 55 50.8	11.3	6.5	0.44	27	6 42.5	11 4 18.28	+7 12 31.6	7.9	4.5	0.31
12	9 10.4	10 35 12.65	11 54 38.2	11.3	6.4	0.44	28	6 39.9	11 5 38.01	7 2 24.1	7.9	4.5	0.30
13	9 6.3	10 34 59.45	11 53 8.8	11.2	6.4	0.43	29	6 37.3	11 6 59.00	6 52 9.0	7.8	4.5	0.30
14	9 2.2	10 34 49.15	11 51 22.9	11.1	6.3	0.43	30	6 34.7	11 8 21.21	6 41 46.4	7.8	4.5	0.30
15	8 58.1	10 34 41.71	11 49 20.9	11.0	6.3	0.43	31	6 32.2	11 9 44.64	6 31 16.4	7.7	4.4	0.30
16	8 54.1	10 34 37.11	+11 47 3.0	10.9	6.2	0.42	June 1	6 29.7	11 11 9.25	+6 20 39.1	7.7	4.4	0.29
17	8 50.1	10 34 35.30	11 44 29.5	10.8	6.2	0.42	2	6 27.2	11 12 35.03	6 9 54.4	7.6	4.4	0.29
18	8 46.2	10 34 36.27	11 41 40.7	10.7	6.1	0.42	3	6 24.7	11 14 1.95	5 59 2.7	7.6	4.3	0.29
19	8 42.3	10 34 39.96	11 38 36.8	10.7	6.1	0.41	4	6 22.2	11 15 29.98	5 48 4.0	7.5	4.3	0.29
20	8 38.5	10 34 46.35	11 35 18.1	10.6	6.0	0.41	5	6 19.7	11 16 59.10	5 36 58.6	7.5	4.3	0.29
21	8 34.7	10 34 55.39	+11 31 44.9	10.5	6.0	0.41	6	6 17.3	11 18 29.29	+5 25 46.5	7.4	4.2	0.28
22	8 31.0	10 35 7.05	11 27 57.4	10.4	5.9	0.40	7	6 14.9	11 20 0.53	5 14 27.8	7.4	4.2	0.28
23	8 27.3	10 35 21.29	11 23 55.9	10.3	5.9	0.40	8	6 12.5	11 21 32.79	5 3 2.6	7.3	4.2	0.28
24	8 23.7	10 35 38.07	11 19 40.6	10.2	5.8	0.40	9	6 10.1	11 23 6.06	4 51 31.0	7.3	4.2	0.28
25	8 20.1	10 35 57.36	11 15 11.6	10.2	5.8	0.39	10	6 7.7	11 24 40.29	4 39 53.3	7.2	4.1	0.28
26	8 16.5	10 36 19.12	+11 10 29.2	10.1	5.7	0.39	11	6 5.4	11 26 15.49	+4 28 9.6	7.2	4.1	0.28
27	8 13.0	10 36 43.30	11 5 33.7	10.0	5.7	0.39	12	6 3.1	11 27 51.61	4 16 19.9	7.1	4.1	0.28
28	8 9.5	10 37 9.87	11 0 25.4	9.9	5.6	0.38	13	6 0.8	11 29 28.66	4 4 24.3	7.1	4.1	0.27
29	8 6.0	10 37 38.80	10 55 4.3	9.8	5.6	0.38	14	5 58.5	11 31 6.60	3 52 23.1	7.1	4.0	0.27
30	8 2.6	10 38 10.05	10 49 30.6	9.8	5.5	0.38	15	5 56.2	11 32 45.43	3 40 16.3	7.0	4.0	0.27
May 1	7 59.2	10 38 43.58	+10 43 44.6	9.7	5.5	0.38	16	5 53.9	11 34 25.12	+3 28 4.0	7.0	4.0	0.27
2	7 55.9	10 39 19.35	10 37 46.6	9.6	5.5	0.37	17	5 51.6	11 36 5.65	3 15 46.4	6.9	4.0	0.27
3	7 52.6	10 39 57.33	10 31 36.5	9.5	5.4	0.37	18	5 49.4	11 37 47.02	3 3 23.5	6.9	3.9	0.26
4	7 49.3	10 40 37.46	10 25 14.8	9.4	5.4	0.37	19	5 47.1	11 39 29.22	2 50 55.4	6.9	3.9	0.26
5	7 46.1	10 41 19.70	10 18 41.5	9.4	5.3	0.36	20	5 44.9	11 41 12.23	2 38 22.2	6.8	3.9	0.26
6	7 42.9	10 42 4.00	+10 11 57.1	9.3	5.3	0.36	21	5 42.7	11 42 56.05	+2 25 44.1	6.8	3.9	0.26
7	7 39.7	10 42 50.33	10 5 1.6	9.2	5.3	0.36	22	5 40.5	11 44 40.67	2 13 1.1	6.7	3.8	0.26
8	7 36.6	10 43 38.65	9 57 55.1	9.1	5.2	0.35	23	5 38.4	11 46 26.07	2 0 13.3	6.7	3.8	0.26
9	7 33.5	10 44 28.91	9 50 38.0	9.1	5.2	0.35	24	5 36.2	11 48 12.26	1 47 20.7	6.7	3.8	0.26
10	7 30.4	10 45 21.07	9 43 10.5	9.0	5.1	0.35	25	5 34.0	11 49 59.22	1 34 23.6	6.6	3.8	0.26
11	7 27.4	10 46 15.08	+ 9 35 32.6	8.9	5.1	0.35	26	5 31.9	11 51 46.95	+1 21 21.9	6.6	3.8	0.25
12	7 24.4	10 47 10.89	9 27 44.6	8.9	5.1	0.34	27	5 29.8	11 53 35.45	1 8 15.8	6.6	3.7	0.25
13	7 21.4	10 48 8.46	9 19 46.8	8.8	5.0	0.34	28	5 27.6	11 55 24.70	0 55 5.3	6.5	3.7	0.25
14	7 18.5	10 49 7.77	9 11 39.4	8.7	5.0	0.34	29	5 25.5	11 57 14.69	0 41 50.5	6.5	3.7	0.25
15	7 15.6	10 50 8.73	9 3 22.4	8.7	5.0	0.33	30	5 23.4	11 59 5.43	0 28 31.6	6.4	3.7	0.25
16	7 12.7	10 51 11.34	+ 8 54 56.0	8.6	4.9	0.33	31	5 21.4	12 0 56.89	+0 15 8.6	6.4	3.7	0.24
17	7 9.8	10 52 15.55	+ 8 46 20.4	8.5	4.9	0.33	32	5 19.3	12 2 49.08	+0 1 41.7	6.4	3.6	0.24

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Jan. 0	17 38.0	12 22 2.42	-0 57 14.1	1.7	17.8	1.27
1	17 34.3	12 22 15.41	0 58 20.7	1.7	17.9	1.27
2	17 30.6	12 22 27.75	0 59 23.0	1.7	17.9	1.27
3	17 26.8	12 22 39.43	1 0 20.9	1.7	18.0	1.28
4	17 23.1	12 22 50.45	1 1 14.5	1.7	18.0	1.28
5	17 19.4	12 23 0.80	-1 2 3.7	1.7	18.1	1.29
6	17 15.6	12 23 10.49	1 2 48.6	1.7	18.1	1.29
7	17 11.8	12 23 19.49	1 3 29.1	1.7	18.2	1.29
8	17 8.0	12 23 27.82	1 4 5.1	1.7	18.3	1.30
9	17 4.2	12 23 35.48	1 4 36.7	1.7	18.3	1.30
10	17 0.4	12 23 42.45	-1 5 3.9	1.7	18.4	1.31
11	16 56.5	12 23 48.73	1 5 26.6	1.7	18.4	1.31
12	16 52.7	12 23 54.33	1 5 44.8	1.7	18.5	1.31
13	16 48.8	12 23 59.24	1 5 58.6	1.7	18.5	1.32
14	16 45.0	12 24 3.47	1 6 8.0	1.8	18.6	1.32
15	16 41.1	12 24 7.00	-1 6 12.9	1.8	18.7	1.33
16	16 37.2	12 24 9.84	1 6 13.3	1.8	18.7	1.33
17	16 33.3	12 24 11.99	1 6 9.2	1.8	18.8	1.33
18	16 29.4	12 24 13.44	1 6 0.6	1.8	18.8	1.34
19	16 25.5	12 24 14.19	1 5 47.5	1.8	18.9	1.34
20	16 21.5	12 24 14.24	-1 5 29.9	1.8	18.9	1.35
21	16 17.6	12 24 13.59	1 5 7.8	1.8	19.0	1.35
22	16 13.7	12 24 12.25	1 4 41.2	1.8	19.0	1.35
23	16 9.7	12 24 10.20	1 4 10.1	1.8	19.1	1.36
24	16 5.7	12 24 7.45	1 3 34.6	1.8	19.2	1.36
25	16 1.7	12 24 4.01	-1 2 54.6	1.8	19.2	1.37
26	15 57.7	12 23 59.87	1 2 10.2	1.8	19.3	1.37
27	15 53.7	12 23 55.02	1 1 21.4	1.8	19.3	1.37
28	15 49.7	12 23 49.48	1 0 28.2	1.8	19.4	1.38
29	15 45.6	12 23 43.24	0 59 30.6	1.8	19.4	1.38
30	15 41.6	12 23 36.31	-0 58 28.6	1.8	19.5	1.39
31	15 37.5	12 23 28.68	0 57 22.3	1.8	19.6	1.39
Feb. 1	15 33.5	12 23 20.37	0 56 11.6	1.8	19.6	1.39
2	15 29.4	12 23 11.38	0 54 56.6	1.8	19.7	1.40
3	15 25.3	12 23 1.70	0 53 37.4	1.9	19.7	1.40
4	15 21.2	12 22 51.35	-0 52 13.9	1.9	19.8	1.40
5	15 17.1	12 22 40.34	0 50 46.3	1.9	19.8	1.41
6	15 12.9	12 22 28.67	0 49 14.6	1.9	19.9	1.41
7	15 8.8	12 22 16.34	0 47 38.9	1.9	19.9	1.41
8	15 4.7	12 22 3.37	0 45 59.2	1.9	20.0	1.42
9	15 0.5	12 21 49.76	-0 44 15.5	1.9	20.0	1.42
10	14 56.4	12 21 35.53	0 42 28.0	1.9	20.1	1.42
11	14 52.2	12 21 20.67	0 40 36.6	1.9	20.1	1.43
12	14 48.0	12 21 5.20	0 38 41.4	1.9	20.2	1.43
13	14 43.8	12 20 49.13	0 36 42.6	1.9	20.2	1.43
14	14 39.6	12 20 32.47	-0 34 40.1	1.9	20.3	1.44
15	14 35.4	12 20 15.22	-0 32 34.0	1.9	20.3	1.44
Feb. 15	14 35.4	12 20 15.22	-0 32 34.0	1.9	20.3	1.44
16	14 31.1	12 19 57.40	0 30 24.5	1.9	20.3	1.44
17	14 26.9	12 19 39.02	0 28 11.6	1.9	20.4	1.45
18	14 22.6	12 19 20.09	0 25 55.5	1.9	20.4	1.45
19	14 18.4	12 19 0.63	0 23 36.0	1.9	20.5	1.45
20	14 14.1	12 18 40.64	-0 21 13.5	1.9	20.5	1.46
21	14 9.9	12 18 20.13	0 18 47.8	1.9	20.5	1.46
22	14 5.6	12 17 59.11	0 16 19.2	1.9	20.6	1.46
23	14 1.3	12 17 37.61	0 13 47.8	1.9	20.6	1.46
24	13 57.0	12 17 15.61	0 11 13.4	1.9	20.7	1.47
25	13 52.7	12 16 53.16	-0 8 36.3	1.9	20.7	1.47
26	13 48.4	12 16 30.25	0 5 56.7	1.9	20.7	1.47
27	13 44.1	12 16 6.91	0 3 14.5	2.0	20.8	1.47
28	13 39.7	12 15 43.14	-0 0 30.0	2.0	20.8	1.47
Mar. 1	13 35.4	12 15 18.97	+0 2 16.7	2.0	20.8	1.48
2	13 31.0	12 14 54.41	+0 5 5.7	2.0	20.8	1.48
3	13 26.7	12 14 29.48	0 7 56.7	2.0	20.9	1.48
4	13 22.4	12 14 4.20	0 10 49.6	2.0	20.9	1.48
5	13 18.0	12 13 38.58	0 13 44.5	2.0	20.9	1.48
6	13 13.6	12 13 12.64	0 16 40.9	2.0	20.9	1.49
7	13 9.3	12 12 46.41	+0 19 38.9	2.0	21.0	1.49
8	13 4.9	12 12 19.90	0 22 38.3	2.0	21.0	1.49
9	13 0.5	12 11 53.13	0 25 39.0	2.0	21.0	1.49
10	12 56.1	12 11 26.13	0 28 40.9	2.0	21.0	1.49
11	12 51.8	12 10 58.91	0 31 43.8	2.0	21.0	1.49
12	12 47.4	12 10 31.48	+0 34 47.5	2.0	21.1	1.50
13	12 43.0	12 10 3.87	0 37 52.1	2.0	21.1	1.50
14	12 38.6	12 9 36.10	0 40 57.3	2.0	21.1	1.50
15	12 34.2	12 9 8.19	0 44 3.0	2.0	21.1	1.50
16	12 29.8	12 8 40.16	0 47 9.1	2.0	21.1	1.50
17	12 25.4	12 8 12.03	+0 50 15.5	2.0	21.1	1.50
18	12 21.0	12 7 43.82	0 53 22.0	2.0	21.1	1.50
19	12 16.6	12 7 15.54	0 56 28.4	2.0	21.1	1.50
20	12 12.1	12 6 47.23	0 59 34.7	2.0	21.1	1.50
21	12 7.7	12 6 18.88	1 2 40.7	2.0	21.1	1.50
22	12 3.3	12 5 50.53	+1 5 46.3	2.0	21.1	1.50
23	11 58.9	12 5 22.18	1 8 51.5	2.0	21.1	1.50
24	11 54.6	12 4 53.87	1 11 56.0	2.0	21.1	1.50
25	11 50.2	12 4 25.60	1 14 59.8	2.0	21.1	1.50
26	11 45.8	12 3 57.41	1 18 2.6	2.0	21.1	1.50
27	11 41.4	12 3 29.30	+1 21 4.4	2.0	21.1	1.50
28	11 37.0	12 3 1.30	1 24 5.0	2.0	21.1	1.50
29	11 32.6	12 2 33.44	1 27 4.4	2.0	21.1	1.50
30	11 28.2	12 2 5.74	1 30 2.3	2.0	21.1	1.50
31	11 23.8	12 1 38.20	1 32 58.7	2.0	21.1	1.50
32	11 19.4	12 1 10.84	+1 35 53.5	2.0	21.0	1.50
33	11 15.0	12 0 43.69	+1 38 46.5	2.0	21.0	1.49

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Semi. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	11 19.4	12 1 10.84	+1 35 53.5	2.0	21.0	1.50	May 17	8 5.4	11 47 56.77	+2 53 41.1	1.8	19.3	1.37
2	11 15.0	12 0 43.69	1 38 46.5	2.0	21.0	1.49	18	8 1.4	11 47 53.28	2 53 48.4	1.8	19.2	1.37
3	11 10.6	12 0 16.77	1 41 37.5	2.0	21.0	1.49	19	7 57.4	11 47 50.45	2 53 51.3	1.8	19.2	1.36
4	11 6.3	11 59 50.10	1 44 26.6	2.0	21.0	1.49	20	7 53.4	11 47 48.28	2 53 49.9	1.8	19.1	1.36
5	11 1.9	11 59 23.71	1 47 13.5	2.0	21.0	1.49	21	7 49.5	11 47 46.77	2 53 44.2	1.8	19.1	1.36
6	10 57.5	11 58 57.61	+1 49 58.2	2.0	21.0	1.49	22	7 45.5	11 47 45.92	+2 53 34.1	1.8	19.0	1.35
7	10 53.2	11 58 31.81	1 52 40.5	2.0	20.9	1.49	23	7 41.6	11 47 45.72	2 53 19.7	1.8	19.0	1.35
8	10 48.8	11 58 6.33	1 55 20.3	2.0	20.9	1.49	24	7 37.7	11 47 46.18	2 53 1.0	1.8	18.9	1.34
9	10 44.4	11 57 41.18	1 57 57.4	2.0	20.9	1.48	25	7 33.8	11 47 47.30	2 52 38.0	1.8	18.9	1.34
10	10 40.1	11 57 16.39	2 0 31.8	2.0	20.9	1.48	26	7 29.8	11 47 49.07	2 52 10.6	1.8	18.8	1.34
11	10 35.8	11 56 51.96	+2 3 3.4	2.0	20.8	1.48	27	7 25.9	11 47 51.50	+2 51 38.9	1.8	18.8	1.33
12	10 31.4	11 56 27.91	2 5 32.2	2.0	20.8	1.48	28	7 22.1	11 47 54.59	2 51 3.0	1.8	18.7	1.33
13	10 27.1	11 56 4.28	2 7 58.1	2.0	20.8	1.48	29	7 18.2	11 47 58.33	2 50 22.8	1.8	18.6	1.32
14	10 22.8	11 55 41.05	2 10 21.0	2.0	20.7	1.48	30	7 14.3	11 48 2.73	2 49 38.4	1.7	18.6	1.32
15	10 18.5	11 55 18.26	2 12 40.7	1.9	20.7	1.47	31	7 10.5	11 48 7.77	2 48 49.8	1.7	18.5	1.32
16	10 14.2	11 54 55.90	+2 14 57.3	1.9	20.7	1.47	June 1	7 6.7	11 48 13.47	+2 47 57.1	1.7	18.4	1.31
17	10 9.9	11 54 34.01	2 17 10.5	1.9	20.6	1.47	2	7 2.8	11 48 19.81	2 47 0.3	1.7	18.4	1.31
18	10 5.6	11 54 12.57	2 19 20.3	1.9	20.6	1.47	3	6 59.0	11 48 26.79	2 45 59.3	1.7	18.3	1.31
19	10 1.3	11 53 51.61	2 21 26.7	1.9	20.6	1.46	4	6 55.2	11 48 34.41	2 44 54.1	1.7	18.3	1.30
20	9 57.1	11 53 31.13	2 23 29.6	1.9	20.5	1.46	5	6 51.4	11 48 42.67	2 43 44.8	1.7	18.2	1.30
21	9 52.8	11 53 11.16	+2 25 28.9	1.9	20.5	1.46	6	6 47.6	11 48 51.55	+2 42 31.5	1.7	18.2	1.29
22	9 48.6	11 52 51.70	2 27 24.7	1.9	20.5	1.46	7	6 43.8	11 49 1.07	2 41 14.1	1.7	18.1	1.29
23	9 44.3	11 52 32.76	2 29 16.7	1.9	20.4	1.45	8	6 40.1	11 49 11.20	2 39 52.6	1.7	18.1	1.29
24	9 40.1	11 52 14.36	2 31 5.0	1.9	20.4	1.45	9	6 36.3	11 49 21.97	2 38 27.2	1.7	18.0	1.28
25	9 35.8	11 51 56.49	2 32 49.5	1.9	20.3	1.45	10	6 32.6	11 49 33.34	2 36 57.9	1.7	18.0	1.28
26	9 31.6	11 51 39.17	+2 34 30.0	1.9	20.3	1.44	11	6 28.9	11 49 45.31	+2 35 24.7	1.7	17.9	1.27
27	9 27.4	11 51 22.41	2 36 6.8	1.9	20.3	1.44	12	6 25.1	11 49 57.89	2 33 47.7	1.7	17.9	1.27
28	9 23.2	11 51 6.23	2 37 39.6	1.9	20.2	1.44	13	6 21.4	11 50 11.07	2 32 6.8	1.7	17.8	1.27
29	9 19.0	11 50 50.63	2 39 8.3	1.9	20.2	1.43	14	6 17.7	11 50 24.83	2 30 22.1	1.7	17.8	1.26
30	9 14.9	11 50 35.62	2 40 32.8	1.9	20.1	1.43	15	6 14.0	11 50 39.18	2 28 33.6	1.7	17.7	1.26
May 1	9 10.7	11 50 21.21	+2 41 53.3	1.9	20.1	1.43	16	6 10.3	11 50 54.12	+2 26 41.4	1.7	17.7	1.26
2	9 6.5	11 50 7.40	2 43 9.7	1.9	20.0	1.42	17	6 6.7	11 51 9.64	2 24 45.5	1.7	17.6	1.25
3	9 2.3	11 49 54.21	2 44 22.0	1.9	20.0	1.42	18	6 3.0	11 51 25.73	2 22 46.0	1.7	17.6	1.25
4	8 58.2	11 49 41.65	2 45 30.1	1.9	19.9	1.42	19	5 59.4	11 51 42.37	2 20 42.8	1.6	17.5	1.25
5	8 54.1	11 49 29.71	2 46 33.9	1.9	19.9	1.41	20	5 55.7	11 51 59.59	2 18 36.1	1.6	17.5	1.24
6	8 50.0	11 49 18.40	+2 47 33.5	1.9	19.8	1.41	21	5 52.1	11 52 17.35	+2 16 25.8	1.6	17.4	1.24
7	8 45.8	11 49 7.74	2 48 28 6	1.9	19.8	1.41	22	5 48.5	11 52 35.67	2 14 12.1	1.6	17.4	1.24
8	8 41.8	11 48 57.72	2 49 19.4	1.9	19.7	1.40	23	5 44.8	11 52 54.55	2 11 54.9	1.6	17.3	1.23
9	8 37.7	11 48 48.33	2 50 5.8	1.9	19.7	1.40	24	5 41.2	11 53 13.97	2 9 34.1	1.6	17.3	1.23
10	8 33.6	11 48 39.59	2 50 48.0	1.8	19.6	1.39	25	5 37.6	11 53 33.93	2 7 9.9	1.6	17.2	1.23
11	8 29.5	11 48 31.51	+2 51 25.9	1.8	19.6	1.39	26	5 34.0	11 53 54.43	+2 4 42.4	1.6	17.2	1.22
12	8 25.5	11 48 24.08	2 51 59.3	1.8	19.5	1.39	27	5 30.4	11 54 15.45	2 2 11.5	1.6	17.1	1.22
13	8 21.4	11 48 17.30	2 52 28.4	1.8	19.5	1.38	28	5 26.9	11 54 37.01	1 59 37.3	1.6	17.1	1.21
14	8 17.4	11 48 11.18	2 52 53.2	1.8	19.4	1.38	29	5 23.3	11 54 59.09	1 56 59.8	1.6	17.0	1.21
15	8 13.4	11 48 5.72	2 53 13.5	1.8	19.4	1.38	30	5 19.8	11 55 21.67	1 54 19.0	1.6	17.0	1.21
16	8 9.4	11 48 0.92	+2 53 29.5	1.8	19.3	1.37	31	5 16.2	11 55 44.76	+1 51 35.0	1.6	16.9	1.20
17	8 5.4	11 47 56.77	+2 53 41.1	1.8	19.3	1.37	32	5 12.7	11 56 8.37	+1 48 47.8	1.6	16.9	1.20

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	11 36.2	6 19 15.90	+22 32 1.9	1.1	9.7	0.75	Feb. 14	8 27.4	6 7 18.63	+22 42 34.3	1.0	9.3	0.72
1	11 31.9	6 18 54.75	22 32 18.6	1.1	9.7	0.75	15	8 23.3	6 7 11.14	22 42 45.9	1.0	9.3	0.72
2	11 27.6	6 18 33.67	22 32 35.2	1.1	9.7	0.75	16	8 19.3	6 7 4.11	22 42 57.4	1.0	9.3	0.72
3	11 23.3	6 18 12.69	22 32 51.7	1.1	9.7	0.75	17	8 15.2	6 6 57.54	22 43 8.8	1.0	9.3	0.71
4	11 19.1	6 17 51.81	22 33 8.1	1.1	9.7	0.75	18	8 11.2	6 6 51.44	22 43 20.2	1.0	9.2	0.71
5	11 14.8	6 17 31.06	+22 33 24.4	1.1	9.7	0.75	19	8 7.2	6 6 45.81	+22 43 31.5	1.0	9.2	0.71
6	11 10.6	6 17 10.43	22 33 40.5	1.1	9.7	0.75	20	8 3.1	6 6 40.66	22 43 42.7	1.0	9.2	0.71
7	11 6.3	6 16 49.95	22 33 56.5	1.1	9.7	0.75	21	7 59.1	6 6 35.97	22 43 53.8	1.0	9.2	0.71
8	11 2.0	6 16 29.63	22 34 12.4	1.1	9.7	0.75	22	7 55.2	6 6 31.76	22 44 4.9	1.0	9.2	0.71
9	10 57.7	6 16 9.48	22 34 28.2	1.1	9.7	0.75	23	7 51.2	6 6 28.03	22 44 15.8	1.0	9.2	0.71
10	10 53.5	6 15 49.50	+22 34 43.9	1.1	9.7	0.75	24	7 47.2	6 6 24.78	+22 44 26.7	1.0	9.1	0.71
11	10 49.2	6 15 29.72	22 34 59.4	1.1	9.7	0.75	25	7 43.2	6 6 22.00	22 44 37.5	1.0	9.1	0.71
12	10 44.9	6 15 10.14	22 35 14.8	1.1	9.7	0.75	26	7 39.2	6 6 19.71	22 44 48.2	1.0	9.1	0.70
13	10 40.7	6 14 50.77	22 35 30.1	1.1	9.7	0.75	27	7 35.3	6 6 17.90	22 44 58.8	1.0	9.1	0.70
14	10 36.4	6 14 31.63	22 35 45.2	1.1	9.6	0.75	28	7 31.3	6 6 16.58	22 45 9.3	1.0	9.1	0.70
15	10 32.2	6 14 12.72	+22 36 0.2	1.1	9.6	0.75	Mar. 1	7 27.3	6 6 15.74	+22 45 19.8	1.0	9.1	0.70
16	10 27.9	6 13 54.06	22 36 15.1	1.1	9.6	0.74	2	7 23.4	6 6 15.40	22 45 30.2	1.0	9.0	0.70
17	10 23.7	6 13 35.65	22 36 29.8	1.1	9.6	0.74	3	7 19.5	6 6 15.54	22 45 40.5	1.0	9.0	0.70
18	10 19.5	6 13 17.51	22 36 44.4	1.1	9.6	0.74	4	7 15.6	6 6 16.17	22 45 50.8	1.0	9.0	0.70
19	10 15.3	6 12 59.64	22 36 58.9	1.1	9.6	0.74	5	7 11.7	6 6 17.29	22 46 0.9	1.0	9.0	0.70
20	10 11.0	6 12 42.06	+22 37 13.3	1.1	9.6	0.74	6	7 7.8	6 6 18.90	+22 46 10.9	1.0	9.0	0.69
21	10 6.8	6 12 24.77	22 37 27.5	1.1	9.6	0.74	7	7 3.9	6 6 21.00	22 46 20.9	1.0	9.0	0.69
22	10 2.6	6 12 7.77	22 37 41.6	1.1	9.6	0.74	8	7 0.0	6 6 23.59	22 46 30.7	1.0	8.9	0.69
23	9 58.4	6 11 51.09	22 37 55.6	1.1	9.6	0.74	9	6 56.1	6 6 26.66	22 46 40.5	1.0	8.9	0.69
24	9 54.2	6 11 34.72	22 38 9.5	1.1	9.6	0.74	10	6 52.2	6 6 30.21	22 46 50.1	1.0	8.9	0.69
25	9 50.0	6 11 18.68	+22 38 23.2	1.1	9.6	0.74	11	6 48.3	6 6 34.25	+22 46 59.7	1.0	8.9	0.69
26	9 45.8	6 11 2.98	22 38 36.8	1.1	9.5	0.74	12	6 44.5	6 6 38.77	22 47 9.2	1.0	8.9	0.69
27	9 41.6	6 10 47.62	22 38 50.3	1.1	9.5	0.74	13	6 40.6	6 6 43.77	22 47 18.5	1.0	8.9	0.68
28	9 37.4	6 10 32.61	22 39 3.7	1.1	9.5	0.74	14	6 36.8	6 6 49.25	22 47 27.8	1.0	8.8	0.68
29	9 33.3	6 10 17.97	22 39 16.9	1.1	9.5	0.73	15	6 33.0	6 6 55.20	22 47 36.8	1.0	8.8	0.68
30	9 29.1	6 10 3.69	+22 39 30.0	1.1	9.5	0.73	16	6 29.1	6 7 1.63	+22 47 45.8	1.0	8.8	0.68
31	9 24.9	6 9 49.79	22 39 43.1	1.1	9.5	0.73	17	6 25.3	6 7 8.52	22 47 54.7	1.0	8.8	0.68
Feb. 1	9 20.8	6 9 36.28	22 39 56.0	1.1	9.5	0.73	18	6 21.5	6 7 15.88	22 48 3.4	1.0	8.8	0.68
2	9 16.6	6 9 23.16	22 40 8.8	1.1	9.5	0.73	19	6 17.7	6 7 23.70	22 48 12.0	1.0	8.8	0.68
3	9 12.5	6 9 10.43	22 40 21.4	1.1	9.4	0.73	20	6 13.9	6 7 31.98	22 48 20.4	1.0	8.7	0.68
4	9 8.3	6 8 58.12	+22 40 34.0	1.1	9.4	0.73	21	6 10.1	6 7 40.73	+22 48 28.8	1.0	8.7	0.67
5	9 4.2	6 8 46.22	22 40 46.4	1.1	9.4	0.73	22	6 6.3	6 7 49.93	22 48 36.9	1.0	8.7	0.67
6	9 0.1	6 8 34.74	22 40 58.8	1.1	9.4	0.73	23	6 2.6	6 7 59.59	22 48 44.9	1.0	8.7	0.67
7	8 56.0	6 8 23.69	22 41 11.0	1.1	9.4	0.73	24	5 58.8	6 8 9.70	22 48 52.8	1.0	8.7	0.67
8	8 51.9	6 8 13.06	22 41 23.2	1.1	9.4	0.72	25	5 55.1	6 8 20.27	22 49 0.5	1.0	8.7	0.67
9	8 47.8	6 8 2.88	+22 41 35.3	1.1	9.4	0.72	26	5 51.3	6 8 31.27	+22 49 7.9	1.0	8.6	0.67
10	8 43.7	6 7 53.13	22 41 47.3	1.1	9.4	0.72	27	5 47.6	6 8 42.71	22 49 15.2	1.0	8.6	0.67
11	8 39.6	6 7 43.83	22 41 59.2	1.1	9.3	0.72	28	5 43.8	6 8 54.60	22 49 22.3	1.0	8.6	0.67
12	8 35.5	6 7 34.98	22 42 11.0	1.1	9.3	0.72	29	5 40.1	6 9 6.93	22 49 29.2	1.0	8.6	0.67
13	8 31.4	6 7 26.58	22 42 22.7	1.0	9.3	0.72	30	5 36.4	6 9 19.69	22 49 35.9	1.0	8.6	0.67
14	8 27.4	6 7 18.63	+22 42 34.3	1.0	9.3	0.72	31	5 32.7	6 9 32.89	+22 49 42.4	1.0	8.6	0.66
15	8 23.3	6 7 11.14	+22 42 45.9	1.0	9.3	0.72	32	5 29.0	6 9 46.51	+22 49 48.7	1.0	8.6	0.66

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	18 48.5	7 33 2.60	+21 24 48.7	1.0	8.5	0.65	Nov. 16	15 51.0	7 36 25.29	+21 20 18.4	1.0	9.2	0.71
2	18 44.8	7 33 17.06	21 24 20.3	1.0	8.5	0.65	17	15 47.0	7 36 18.77	21 20 38.0	1.0	9.2	0.71
3	18 41.1	7 33 31.10	21 23 52.7	1.0	8.5	0.65	18	15 43.0	7 36 11.81	21 20 58.8	1.0	9.2	0.71
4	18 37.4	7 33 44.73	21 23 26.0	1.0	8.5	0.66	19	15 38.9	7 36 4.39	21 21 20.6	1.0	9.3	0.71
5	18 33.7	7 33 57.95	21 23 0.1	1.0	8.5	0.66	20	15 34.8	7 35 56.52	21 21 43.4	1.1	9.3	0.71
6	18 30.0	7 34 10.75	+21 22 35.1	1.0	8.6	0.66	21	15 30.8	7 35 48.20	+21 22 7.3	1.1	9.3	0.71
7	18 26.2	7 34 23.12	21 22 11.0	1.0	8.6	0.66	22	15 26.7	7 35 39.44	21 22 32.2	1.1	9.3	0.71
8	18 22.5	7 34 35.07	21 21 47.8	1.0	8.6	0.66	23	15 22.6	7 35 30.24	21 22 58.1	1.1	9.3	0.71
9	18 18.8	7 34 46.59	21 21 25.5	1.0	8.6	0.66	24	15 18.5	7 35 20.60	21 23 25.0	1.1	9.3	0.72
10	18 15.0	7 34 57.68	21 21 4.2	1.0	8.6	0.66	25	15 14.4	7 35 10.54	21 23 52.8	1.1	9.3	0.72
11	18 11.2	7 35 8.34	+21 20 43.8	1.0	8.6	0.66	26	15 10.3	7 35 0.05	+21 24 21.6	1.1	9.4	0.72
12	18 7.5	7 35 18.56	21 20 24.4	1.0	8.7	0.66	27	15 6.3	7 34 49.14	21 24 51.4	1.1	9.4	0.72
13	18 3.8	7 35 28.34	21 20 5.9	1.0	8.7	0.66	28	15 2.2	7 34 37.82	21 25 22.1	1.1	9.4	0.72
14	18 0.0	7 35 37.68	21 19 48.4	1.0	8.7	0.67	29	14 58.0	7 34 26.09	21 25 53.7	1.1	9.4	0.72
15	17 56.2	7 35 46.57	21 19 32.0	1.0	8.7	0.67	30	14 53.8	7 34 13.96	21 26 26.1	1.1	9.4	0.72
16	17 52.4	7 35 55.01	+21 19 16.6	1.0	8.7	0.67	Dec. 1	14 49.7	7 34 1.43	+21 26 59.4	1.1	9.4	0.72
17	17 48.6	7 36 3.01	21 19 2.2	1.0	8.7	0.67	2	14 45.5	7 33 48.51	21 27 33.6	1.1	9.4	0.72
18	17 44.8	7 36 10.55	21 18 48.8	1.0	8.7	0.67	3	14 41.4	7 33 35.22	21 28 8.6	1.1	9.5	0.72
19	17 41.0	7 36 17.64	21 18 36.4	1.0	8.8	0.67	4	14 37.2	7 33 21.55	21 28 44.4	1.1	9.5	0.73
20	17 37.2	7 36 24.26	21 18 25.2	1.0	8.8	0.67	5	14 33.0	7 33 7.51	21 29 21.0	1.1	9.5	0.73
21	17 33.4	7 36 30.43	+21 18 14.9	1.0	8.8	0.67	6	14 28.9	7 32 53.12	+21 29 58.3	1.1	9.5	0.73
22	17 29.5	7 36 36.13	21 18 5.8	1.0	8.8	0.67	7	14 24.7	7 32 38.37	21 30 36.4	1.1	9.5	0.73
23	17 25.7	7 36 41.36	21 17 57.7	1.0	8.8	0.68	8	14 20.5	7 32 23.28	21 31 15.2	1.1	9.5	0.73
24	17 21.8	7 36 46.13	21 17 50.8	1.0	8.8	0.68	9	14 16.3	7 32 7.85	21 31 54.7	1.1	9.5	0.73
25	17 18.0	7 36 50.42	21 17 44.9	1.0	8.9	0.68	10	14 12.1	7 31 52.09	21 32 34.9	1.1	9.5	0.73
26	17 14.1	7 36 54.25	+21 17 40.2	1.0	8.9	0.68	11	14 7.9	7 31 36.01	+21 33 15.7	1.1	9.5	0.73
27	17 10.2	7 36 57.60	21 17 36.5	1.0	8.9	0.68	12	14 3.7	7 31 19.61	21 33 57.2	1.1	9.5	0.73
28	17 6.3	7 37 0.47	21 17 34.0	1.0	8.9	0.68	13	13 59.5	7 31 2.91	21 34 39.2	1.1	9.6	0.73
29	17 2.4	7 37 2.87	21 17 32.6	1.0	8.9	0.68	14	13 55.3	7 30 45.91	21 35 21.8	1.1	9.6	0.73
30	16 58.5	7 37 4.80	21 17 32.3	1.0	8.9	0.68	15	13 51.1	7 30 28.62	21 36 5.0	1.1	9.6	0.73
31	16 54.6	7 37 6.25	+21 17 33.1	1.0	9.0	0.69	16	13 46.9	7 30 11.06	+21 36 48.7	1.1	9.6	0.73
Nov. 1	16 50.7	7 37 7.22	21 17 35.0	1.0	9.0	0.69	17	13 42.6	7 29 53.22	21 37 32.9	1.1	9.6	0.74
2	16 46.8	7 37 7.72	21 17 38.1	1.0	9.0	0.69	18	13 38.4	7 29 35.11	21 38 17.5	1.1	9.6	0.74
3	16 42.9	7 37 7.74	21 17 42.3	1.0	9.0	0.69	19	13 34.2	7 29 16.76	21 39 2.6	1.1	9.6	0.74
4	16 38.9	7 37 7.29	21 17 47.6	1.0	9.0	0.69	20	13 29.9	7 28 58.17	21 39 48.1	1.1	9.6	0.74
5	16 35.0	7 37 6.37	+21 17 54.0	1.0	9.0	0.69	21	13 25.7	7 28 39.34	+21 40 34.0	1.1	9.6	0.74
6	16 31.0	7 37 4.98	21 18 1.6	1.0	9.1	0.69	22	13 21.4	7 28 20.29	21 41 20.3	1.1	9.6	0.74
7	16 27.0	7 37 3.11	21 18 10.3	1.0	9.1	0.69	23	13 17.2	7 28 1.04	21 42 6.9	1.1	9.6	0.74
8	16 23.1	7 37 0.77	21 18 20.1	1.0	9.1	0.70	24	13 12.9	7 27 41.58	21 42 53.8	1.1	9.6	0.74
9	16 19.1	7 36 57.97	21 18 31.0	1.0	9.1	0.70	25	13 8.7	7 27 21.94	21 43 41.0	1.1	9.7	0.74
10	16 15.1	7 36 54.69	+21 18 43.0	1.0	9.1	0.70	26	13 4.4	7 27 2.12	+21 44 28.4	1.1	9.7	0.74
11	16 11.1	7 36 50.95	21 18 56.2	1.0	9.1	0.70	27	13 0.2	7 26 42.14	21 45 16.0	1.1	9.7	0.74
12	16 7.1	7 36 46.75	21 19 10.4	1.0	9.2	0.70	28	12 55.9	7 26 22.01	21 46 3.8	1.1	9.7	0.74
13	16 3.1	7 36 42.08	21 19 25.7	1.0	9.2	0.70	29	12 51.6	7 26 1.74	21 46 51.8	1.1	9.7	0.74
14	15 59.1	7 36 36.94	21 19 42.2	1.0	9.2	0.70	30	12 47.3	7 25 41.34	21 47 39.8	1.1	9.7	0.74
15	15 55.1	7 36 31.35	+21 19 59.8	1.0	9.2	0.70	31	12 43.1	7 25 20.83	+21 48 28.0	1.1	9.7	0.74
16	15 51.0	7 36 25.29	+21 20 18.4	1.0	9.2	0.71	32	12 38.8	7 25 0.21	+21 49 16.3	1.1	9.7	0.74

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	17 45.2	12 29 18.16	−2 22 40.1	0.5	1.8	0.12	Feb. 15	14 42.6	12 27 28.74	−2 9 15.5	0.5	1.9	0.13
1	17 41.3	12 29 20.29	2 22 51.4	0.5	1.8	0.12	16	14 38.5	12 27 22.14	2 8 31.4	0.5	1.9	0.13
2	17 37.4	12 29 22.21	2 23 1.3	0.5	1.8	0.12	17	14 34.5	12 27 15.39	2 7 46.3	0.5	1.9	0.13
3	17 33.5	12 29 23.92	2 23 9.9	0.5	1.8	0.12	18	14 30.4	12 27 8.51	2 7 0.4	0.5	1.9	0.13
4	17 29.6	12 29 25.42	2 23 17.1	0.5	1.8	0.12	19	14 26.4	12 27 1.49	2 6 13.7	0.5	1.9	0.13
5	17 25.7	12 29 26.71	−2 23 23.0	0.5	1.8	0.12	20	14 22.3	12 26 54.33	−2 5 26.1	0.5	1.9	0.13
6	17 21.8	12 29 27.79	2 23 27.5	0.5	1.8	0.12	21	14 18.3	12 26 47.05	2 4 37.7	0.5	1.9	0.13
7	17 17.9	12 29 28.67	2 23 30.7	0.5	1.8	0.12	22	14 14.2	12 26 39.64	2 3 48.5	0.5	1.9	0.13
8	17 14.0	12 29 29.33	2 23 32.6	0.5	1.9	0.12	23	14 10.2	12 26 32.10	2 2 58.6	0.5	1.9	0.13
9	17 10.0	12 29 29.79	2 23 33.2	0.5	1.9	0.12	24	14 6.1	12 26 24.42	2 2 7.9	0.5	1.9	0.13
10	17 6.1	12 29 30.04	−2 23 32.4	0.5	1.9	0.12	25	14 2.0	12 26 16.63	−2 1 16.4	0.5	1.9	0.13
11	17 2.2	12 29 30.08	2 23 30.3	0.5	1.9	0.12	26	13 58.0	12 26 8.73	2 0 24.2	0.5	1.9	0.13
12	16 58.2	12 29 29.92	2 23 26.8	0.5	1.9	0.12	27	13 53.9	12 26 0.72	1 59 31.4	0.5	1.9	0.13
13	16 54.3	12 29 29.54	2 23 22.0	0.5	1.9	0.12	28	13 49.8	12 25 52.59	1 58 37.9	0.5	1.9	0.13
14	16 50.4	12 29 28.97	2 23 15.9	0.5	1.9	0.12	Mar. 1	13 45.8	12 25 44.36	1 57 43.8	0.5	1.9	0.13
15	16 46.4	12 29 28.19	−2 23 8.6	0.5	1.9	0.12	2	13 41.7	12 25 36.04	−1 56 49.1	0.5	1.9	0.13
16	16 42.5	12 29 27.20	2 22 59.9	0.5	1.9	0.12	3	13 37.6	12 25 27.62	1 55 53.8	0.5	1.9	0.13
17	16 38.5	12 29 26.02	2 22 49.9	0.5	1.9	0.12	4	13 33.6	12 25 19.10	1 54 57.9	0.5	1.9	0.13
18	16 34.6	12 29 24.63	2 22 38.6	0.5	1.9	0.12	5	13 29.5	12 25 10.49	1 54 1.4	0.5	1.9	0.13
19	16 30.6	12 29 23.04	2 22 26.1	0.5	1.9	0.12	6	13 25.4	12 25 1.80	1 53 4.5	0.5	1.9	0.13
20	16 26.6	12 29 21.24	−2 22 12.2	0.5	1.9	0.12	7	13 21.3	12 24 53.03	−1 52 7.1	0.5	1.9	0.13
21	16 22.7	12 29 19.25	2 21 57.1	0.5	1.9	0.12	8	13 17.3	12 24 44.17	1 51 9.3	0.5	1.9	0.13
22	16 18.7	12 29 17.06	2 21 40.7	0.5	1.9	0.13	9	13 13.2	12 24 35.24	1 50 11.0	0.5	1.9	0.13
23	16 14.7	12 29 14.67	2 21 23.1	0.5	1.9	0.13	10	13 9.1	12 24 26.25	1 49 12.3	0.5	1.9	0.13
24	16 10.8	12 29 12.09	2 21 4.2	0.5	1.9	0.13	11	13 5.0	12 24 17.19	1 48 13.3	0.5	1.9	0.13
25	16 6.8	12 29 9.31	−2 20 44.0	0.5	1.9	0.13	12	13 0.9	12 24 8.07	−1 47 13.8	0.5	1.9	0.13
26	16 2.8	12 29 6.33	2 20 22.7	0.5	1.9	0.13	13	12 56.9	12 23 58.89	1 46 14.1	0.5	1.9	0.13
27	15 58.8	12 29 3.17	2 20 0.1	0.5	1.9	0.13	14	12 52.8	12 23 49.67	1 45 14.1	0.5	1.9	0.13
28	15 54.8	12 28 59.81	2 19 36.3	0.5	1.9	0.13	15	12 48.7	12 23 40.40	1 44 13.9	0.5	1.9	0.13
29	15 50.8	12 28 56.26	2 19 11.3	0.5	1.9	0.13	16	12 44.6	12 23 31.08	1 43 13.4	0.5	1.9	0.13
30	15 46.9	12 28 52.52	−2 18 45.1	0.5	1.9	0.13	17	12 40.5	12 23 21.73	−1 42 12.6	0.5	1.9	0.13
31	15 42.9	12 28 48.59	2 18 17.8	0.5	1.9	0.13	18	12 36.4	12 23 12.35	1 41 11.8	0.5	1.9	0.13
Feb. 1	15 38.9	12 28 44.48	2 17 49.2	0.5	1.9	0.13	19	12 32.3	12 23 2.93	1 40 10.7	0.5	1.9	0.13
2	15 34.9	12 28 40.18	2 17 19.5	0.5	1.9	0.13	20	12 28.2	12 22 53.48	1 39 9.5	0.5	1.9	0.13
3	15 30.8	12 28 35.70	2 16 48.7	0.5	1.9	0.13	21	12 24.1	12 22 44.01	1 38 8.2	0.5	1.9	0.13
4	15 26.8	12 28 31.04	−2 16 16.7	0.5	1.9	0.13	22	12 20.0	12 22 34.52	−1 37 6.9	0.5	1.9	0.13
5	15 22.8	12 28 26.21	2 15 43.6	0.5	1.9	0.13	23	12 16.0	12 22 25.01	1 36 5.5	0.5	1.9	0.13
6	15 18.8	12 28 21.20	2 15 9.5	0.5	1.9	0.13	24	12 11.9	12 22 15.49	1 35 4.0	0.5	1.9	0.13
7	15 14.8	12 28 16.02	2 14 34.2	0.5	1.9	0.13	25	12 7.8	12 22 5.96	1 34 2.5	0.5	1.9	0.13
8	15 10.8	12 28 10.67	2 13 57.9	0.5	1.9	0.13	26	12 3.7	12 21 56.43	1 33 1.1	0.5	1.9	0.13
9	15 6.8	12 28 5.15	−2 13 20.6	0.5	1.9	0.13	27	11 59.6	12 21 46.90	−1 31 59.7	0.5	1.9	0.13
10	15 2.7	12 27 59.48	2 12 42.2	0.5	1.9	0.13	28	11 55.5	12 21 37.37	1 30 58.4	0.5	1.9	0.13
11	14 58.7	12 27 53.64	2 12 2.8	0.5	1.9	0.13	29	11 51.4	12 21 27.85	1 29 57.2	0.5	1.9	0.13
12	14 54.7	12 27 47.65	2 11 22.4	0.5	1.9	0.13	30	11 47.3	12 21 18.35	1 28 56.2	0.5	1.9	0.13
13	14 50.6	12 27 41.50	2 10 41.0	0.5	1.9	0.13	31	11 43.2	12 21 8.87	1 27 55.3	0.5	1.9	0.13
14	14 46.6	12 27 35.19	−2 9 58.7	0.5	1.9	0.13	32	11 39.2	12 20 59.40	−1 26 54.6	0.5	1.9	0.13
15	14 42.6	12 27 28.74	−2 9 15.5	0.5	1.9	0.13	33	11 35.1	12 20 49.96	−1 25 54.1	0.5	1.9	0.13

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	11 39.2	12 20 59.40	−1 26 54.6	0.5	1.9	0.13	May 17	8 32.6	12 15 13.18	−0 50 44.2	0.5	1.9	0.13
2	11 35.1	12 20 49.96	1 25 54.1	0.5	1.9	0.13	18	8 28.5	12 15 8.77	0 50 18.0	0.5	1.9	0.13
3	11 31.0	12 20 40.56	1 24 53.8	0.5	1.9	0.13	19	8 24.5	12 15 4.53	0 49 53.0	0.5	1.9	0.13
4	11 26.9	12 20 31.19	1 23 53.8	0.5	1.9	0.13	20	8 20.5	12 15 0.47	0 49 29.1	0.5	1.9	0.13
5	11 22.8	12 20 21.85	1 22 54.1	0.5	1.9	0.13	21	8 16.5	12 14 56.58	0 49 6.4	0.5	1.9	0.13
6	11 18.7	12 20 12.55	−1 21 54.7	0.5	1.9	0.13	22	8 12.5	12 14 52.87	−0 48 44.8	0.5	1.9	0.13
7	11 14.6	12 20 3.31	1 20 55.7	0.5	1.9	0.13	23	8 8.6	12 14 49.32	0 48 24.4	0.5	1.9	0.13
8	11 10.5	12 19 54.12	1 19 57.1	0.5	1.9	0.13	24	8 4.6	12 14 45.96	0 48 5.2	0.5	1.9	0.13
9	11 6.5	12 19 44.99	1 18 58.9	0.5	1.9	0.13	25	8 0.6	12 14 42.79	0 47 47.2	0.5	1.9	0.13
10	11 2.4	12 19 35.91	1 18 1.1	0.5	1.9	0.13	26	7 56.6	12 14 39.79	0 47 30.4	0.5	1.9	0.13
11	10 58.3	12 19 26.91	−1 17 3.8	0.5	1.9	0.13	27	7 52.6	12 14 36.97	−0 47 14.7	0.5	1.9	0.13
12	10 54.2	12 19 17.97	1 16 7.0	0.5	1.9	0.13	28	7 48.6	12 14 34.34	0 47 0.3	0.5	1.9	0.13
13	10 50.1	12 19 9.10	1 15 10.7	0.5	1.9	0.13	29	7 44.7	12 14 31.89	0 46 47.1	0.5	1.9	0.13
14	10 46.1	12 19 0.30	1 14 14.8	0.5	1.9	0.13	30	7 40.7	12 14 29.63	0 46 35.1	0.5	1.9	0.12
15	10 42.0	12 18 51.58	1 13 19.6	0.5	1.9	0.13	31	7 36.7	12 14 27.56	0 46 24.3	0.5	1.9	0.12
16	10 37.9	12 18 42.95	−1 12 24.9	0.5	1.9	0.13	June 1	7 32.8	12 14 25.68	−0 46 14.8	0.5	1.9	0.12
17	10 33.8	12 18 34.40	1 11 30.8	0.5	1.9	0.13	2	7 28.8	12 14 23.99	0 46 6.6	0.5	1.9	0.12
18	10 29.8	12 18 25.93	1 10 37.3	0.5	1.9	0.13	3	7 24.9	12 14 22.49	0 45 59.6	0.5	1.9	0.12
19	10 25.7	12 18 17.56	1 9 44.4	0.5	1.9	0.13	4	7 20.9	12 14 21.18	0 45 53.8	0.5	1.9	0.12
20	10 21.6	12 18 9.29	1 8 52.2	0.5	1.9	0.13	5	7 17.0	12 14 20.06	0 45 49.3	0.5	1.9	0.12
21	10 17.6	12 18 1.11	−1 8 0.7	0.5	1.9	0.13	6	7 13.0	12 14 19.14	−0 45 46.1	0.5	1.9	0.12
22	10 13.5	12 17 53.03	1 7 9.9	0.5	1.9	0.13	7	7 9.1	12 14 18.40	0 45 44.1	0.5	1.9	0.12
23	10 9.4	12 17 45.06	1 6 19.8	0.5	1.9	0.13	8	7 5.1	12 14 17.87	0 45 43.4	0.5	1.9	0.12
24	10 5.4	12 17 37.20	1 5 30.5	0.5	1.9	0.13	9	7 1.2	12 14 17.52	0 45 43.9	0.5	1.9	0.12
25	10 1.3	12 17 29.45	1 4 42.0	0.5	1.9	0.13	10	6 57.2	12 14 17.37	0 45 45.8	0.5	1.9	0.12
26	9 57.2	12 17 21.80	−1 3 54.3	0.5	1.9	0.13	11	6 53.3	12 14 17.42	−0 45 48.8	0.5	1.9	0.12
27	9 53.2	12 17 14.28	1 3 7.2	0.5	1.9	0.13	12	6 49.4	12 14 17.65	0 45 53.1	0.5	1.9	0.12
28	9 49.1	12 17 6.89	1 2 21.0	0.5	1.9	0.13	13	6 45.5	12 14 18.08	0 45 58.7	0.5	1.9	0.12
29	9 45.1	12 16 59.61	1 1 35.6	0.5	1.9	0.13	14	6 41.5	12 14 18.70	0 46 5.6	0.5	1.9	0.12
30	9 41.0	12 16 52.46	1 0 51.2	0.5	1.9	0.13	15	6 37.6	12 14 19.52	0 46 13.7	0.5	1.8	0.12
May 1	9 37.0	12 16 45.45	−1 0 7.6	0.5	1.9	0.13	16	6 33.7	12 14 20.52	−0 46 23.1	0.5	1.8	0.12
2	9 33.0	12 16 38.57	0 59 24.9	0.5	1.9	0.13	17	6 29.8	12 14 21.72	0 46 33.7	0.5	1.8	0.12
3	9 28.9	12 16 31.82	0 58 43.2	0.5	1.9	0.13	18	6 25.9	12 14 23.12	0 46 45.5	0.5	1.8	0.12
4	9 24.9	12 16 25.21	0 58 2.4	0.5	1.9	0.13	19	6 22.0	12 14 24.70	0 46 58.7	0.5	1.8	0.12
5	9 20.8	12 16 18.75	0 57 22.5	0.5	1.9	0.13	20	6 18.1	12 14 26.48	0 47 13.1	0.5	1.8	0.12
6	9 16.8	12 16 12.43	−0 56 43.6	0.5	1.9	0.13	21	6 14.2	12 14 28.45	−0 47 28.7	0.5	1.8	0.12
7	9 12.7	12 16 6.26	0 56 5.7	0.5	1.9	0.13	22	6 10.3	12 14 30.62	0 47 45.5	0.5	1.8	0.12
8	9 8.7	12 16 0.24	0 55 28.8	0.5	1.9	0.13	23	6 6.4	12 14 32.97	0 48 3.3	0.5	1.8	0.12
9	9 4.7	12 15 51.38	0 54 53.0	0.5	1.9	0.13	24	6 2.5	12 14 35.52	0 48 23.0	0.5	1.8	0.12
10	9 0.7	12 15 48.67	0 54 18.1	0.5	1.9	0.13	25	5 58.6	12 14 38.26	0 48 43.6	0.5	1.8	0.12
11	8 56.6	12 15 43.11	−0 53 44.3	0.5	1.9	0.13	26	5 54.7	12 14 41.19	−0 49 5.4	0.5	1.8	0.12
12	8 52.6	12 15 37.71	0 53 11.6	0.5	1.9	0.13	27	5 50.9	12 14 44.31	0 49 28.5	0.5	1.8	0.12
13	8 48.6	12 15 32.48	0 52 39.9	0.5	1.9	0.13	28	5 47.0	12 14 47.62	0 49 52.8	0.5	1.8	0.12
14	8 44.6	12 15 27.41	0 52 9.3	0.5	1.9	0.13	29	5 43.1	12 14 51.13	0 50 18.3	0.5	1.8	0.12
15	8 40.6	12 15 22.50	0 51 39.8	0.5	1.9	0.13	30	5 39.2	12 14 54.82	0 50 45.0	0.5	1.8	0.12
16	8 36.6	12 15 17.75	−0 51 11.4	0.5	1.9	0.13	31	5 35.4	12 14 58.70	−0 51 12.9	0.5	1.8	0.12
17	8 32.6	12 15 13.18	−0 50 44.2	0.5	1.9	0.13	32	5 31.5	12 15 2.77	−0 51 42.1	0.5	1.8	0.12

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	8 41.9	3 24 30.07	+16 50 5.9	0.3	1.3	0.09	Feb. 15	5 40.1	3 23 33.20	+16 49 23.9	0.3	1.3	0.09
1	8 37.9	3 24 25.96	16 49 53.7	0.3	1.3	0.09	16	5 36.2	3 23 35.18	16 49 35.1	0.3	1.3	0.09
2	8 33.9	3 24 21.95	16 49 42.0	0.3	1.3	0.09	17	5 32.3	3 23 37.29	16 49 46.8	0.3	1.3	0.09
3	8 30.0	3 24 18.05	16 49 30.7	0.3	1.3	0.09	18	5 28.4	3 23 39.54	16 49 59.1	0.3	1.3	0.09
4	8 26.0	3 24 14.26	16 49 19.9	0.3	1.3	0.09	19	5 24.6	3 23 41.93	16 50 11.8	0.3	1.3	0.09
5	8 22.0	3 24 10.60	+16 49 9.5	0 3	1.3	0.09	20	5 20.7	3 23 44.45	+16 50 25.0	0.3	1.3	0.09
6	8 18.0	3 24 7.06	16 48 59.7	0.3	1.3	0.09	21	5 16.8	3 23 47.11	16 50 38.7	0.3	1.3	0.09
7	8 14.0	3 24 3.64	16 48 50.3	0.3	1.3	0.09	22	5 12.9	3 23 49.90	16 50 52.9	0.3	1.3	0.09
8	8 10.0	3 24 0.34	16 48 41.4	0.3	1.3	0.09	23	5 9.0	3 23 52.82	16 51 7.6	0.3	1.3	0.09
9	8 6.0	3 23 57.16	16 48 33.0	0.3	1.3	0.09	24	5 5.1	3 23 55.88	16 51 22.7	0.3	1.3	0.09
10	8 2.0	3 23 54.10	+16 48 25.1	0.3	1.3	0.09	25	5 1.2	3 23 59.07	+16 51 38.2	0.3	1.3	0.09
11	7 58.0	3 23 51.17	16 48 17.6	0.3	1.3	0.09	26	4 57.4	3 24 2.38	16 51 54.3	0.3	1.3	0.09
12	7 54.1	3 23 48.37	16 48 10.7	0.3	1.3	0.09	27	4 53.5	3 24 5.84	16 52 10.8	0.3	1.3	0.09
13	7 50.1	3 23 45.70	16 48 4.3	0.3	1.3	0.09	28	4 49.6	3 24 9.42	16 52 27.8	0.3	1.3	0.09
14	7 46.1	3 23 43.16	16 47 58.4	0.3	1.3	0.09	29	4 45.7	3 24 13.14	+16 52 45.2	0.3	1.3	0.09
15	7 42.1	3 23 40.74	+16 47 53.0	0.3	1.3	0.09	Sept. 1	16 58.0	3 43 56.34	+18 0 12.9	0.3	1.3	0.09
16	7 38.2	3 23 38.46	16 47 48.1	0.3	1.3	0.09	2	16 54.1	3 43 56.06	18 0 8.7	0.3	1.3	0.09
17	7 34.2	3 23 36.30	16 47 43.7	0.3	1.3	0.09	3	16 50.1	3 43 55.64	18 0 3.9	0.3	1.3	0.09
18	7 30.2	3 23 34.27	16 47 39.8	0.3	1.3	0.09	4	16 46.2	3 43 55.08	17 59 58.8	0.3	1.3	0.09
19	7 26.3	3 23 32.37	16 47 36.4	0.3	1.3	0.09	5	16 42.2	3 43 54.40	17 59 53.2	0.3	1.3	0.09
20	7 22.3	3 23 30.61	+16 47 33.6	0.3	1.3	0.09	6	16 38.3	3 43 53.58	+17 59 47.2	0.3	1.3	0.09
21	7 18.4	3 23 28.98	16 47 31.2	0.3	1.3	0.09	7	16 34.4	3 43 52.62	17 59 40.8	0.3	1.3	0.09
22	7 14.4	3 23 27.49	16 47 29.4	0.3	1.3	0.09	8	16 30.4	3 43 51.53	17 59 33.9	0.3	1.3	0.09
23	7 10.5	3 23 26.13	16 47 28.2	0.3	1.3	0.09	9	16 26.5	3 43 50.30	17 59 26.7	0.3	1.3	0.09
24	7 6.5	3 23 24.91	16 47 27.4	0.3	1.3	0.09	10	16 22.5	3 43 48.94	17 59 19.0	0.3	1.3	0.09
25	7 2.6	3 23 23.83	+16 47 27.2	0.3	1.3	0.09	11	16 18.5	3 43 47 45	+17 59 10.9	0.3	1.3	0.09
26	6 58.6	3 23 22.88	16 47 27.5	0.3	1.3	0.09	12	16 14.6	3 43 45.83	17 59 2.4	0.3	1.3	0.09
27	6 54.6	3 23 22.06	16 47 28.2	0.3	1.3	0.09	13	16 10.6	3 43 44.08	17 58 53.5	0.3	1.3	0.09
28	6 50.7	3 23 21.39	16 47 29.6	0.3	1.3	0.09	14	16 6.7	3 43 42.20	17 58 44.1	0.3	1.3	0.09
29	6 46.8	3 23 20.86	16 47 31.5	0.3	1.3	0.09	15	16 2.7	3 43 40.19	17 58 34.5	0.3	1.3	0.09
30	6 42.8	3 23 20.46	+16 47 33.9	0.3	1.3	0.09	16	15 58.7	3 43 38.04	+17 58 24.4	0.3	1.3	0.09
31	6 38.9	3 23 20.21	16 47 36.8	0.3	1.3	0.09	17	15 54.8	3 43 35.77	17 58 13.9	0.3	1.3	0.09
Feb. 1	6 35.0	3 23 20.09	16 47 40.3	0.3	1.3	0.09	18	15 50.8	3 43 33.38	17 58 3.0	0.3	1.3	0.09
2	6 31.0	3 23 20.12	16 47 44.3	0.3	1.3	0.09	19	15 46.8	3 43 30.86	17 57 51.7	0.3	1.3	0.09
3	6 27.1	3 23 20.28	16 47 48.8	0.3	1.3	0.09	20	15 42.8	3 43 28.22	17 57 40.1	0.3	1.3	0.09
4	6 23.2	3 23 20.58	+16 47 53.8	0.3	1.3	0.09	21	15 38.8	3 43 25.45	+17 57 28.1	0.3	1.3	0.09
5	6 19.2	3 23 21.03	16 47 59.4	0.3	1.3	0.09	22	15 34.9	3 43 22.56	17 57 15.6	0.3	1.3	0.09
6	6 15.3	3 23 21.62	16 48 5.5	0.3	1.3	0.09	23	15 30.9	3 43 19.54	17 57 2.8	0.3	1.3	0.09
7	6 11.4	3 23 22.35	16 48 12.1	0.3	1.3	0.09	24	15 26.9	3 43 16.40	17 56 49.6	0.3	1.3	0.09
8	6 7.5	3 23 23.22	16 48 19.3	0.3	1.3	0.09	25	15 22.9	3 43 13.14	17 56 36.1	0.3	1.3	0.09
9	6 3.6	3 23 24.23	+16 48 27.0	0.3	1.3	0.09	26	15 18.9	3 43 9.76	+17 56 22.2	0.3	1.3	0.09
10	5 59.6	3 23 25.37	16 48 35.1	0.3	1.3	0.09	27	15 14.9	3 43 6.27	17 56 7.9	0.3	1.3	0.09
11	5 55.7	3 23 26.66	16 48 43.8	0.3	1.3	0.09	28	15 11.0	3 43 2.66	17 55 53.3	0.3	1.3	0.09
12	5 51.8	3 23 28.09	16 48 53.1	0.3	1.3	0.09	29	15 7.0	3 42 58.94	17 55 38.4	0.3	1.3	0.09
13	5 47.9	3 23 29.66	16 49 2.9	0.3	1.3	0.09	30	15 3.0	3 42 55.10	17 55 23.2	0.3	1.3	0.09
14	5 44.0	3 23 31.36	+16 49 13.1	0.3	1.3	0.09	31	14 59.0	3 42 51.15	+17 55 7.6	0.3	1.3	0.09
15	5 40.1	3 23 33.20	+16 49 23.9	0.3	1.3	0.09	32	14 55.0	3 42 47.08	+17 54 51.6	0.3	1.3	0.09

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	14 59.0	3 42 51.15	+17 55 7.6	0.3	1.3	0.09	Nov. 16	11 53.6	3 38 21.31	+17 39 4.1	0.3	1.3	0.09
2	14 55.0	3 42 47.08	17 54 51.6	0.3	1.3	0.09	17	11 49.6	3 38 14.40	17 38 40.8	0.3	1.3	0.09
3	14 51.0	3 42 42.90	17 54 35.3	0.3	1.3	0.09	18	11 45.5	3 38 7.48	17 38 17.5	0.3	1.3	0.09
4	14 47.0	3 42 38.62	17 54 18.7	0.3	1.3	0.09	19	11 41.5	3 38 0.56	17 37 54.2	0.3	1.3	0.09
5	14 43.0	3 42 34.24	17 54 1.8	0.3	1.3	0.09	20	11 37.4	3 37 53.65	17 37 31.2	0.3	1.3	0.09
6	14 39.0	3 42 29.75	+17 53 44.6	0.3	1.3	0.09	21	11 33.4	3 37 46.75	+17 37 8.1	0.3	1.3	0.09
7	14 34.9	3 42 25.17	17 53 27.1	0.3	1.3	0.09	22	11 29.3	3 37 39.86	17 36 45.2	0.3	1.3	0.09
8	14 30.9	3 42 20.48	17 53 9.3	0.3	1.3	0.09	23	11 25.3	3 37 32.99	17 36 22.3	0.3	1.3	0.09
9	14 26.9	3 42 15.68	17 52 51.3	0.3	1.3	0.09	24	11 21.3	3 37 26.12	17 35 59.6	0.3	1.3	0.09
10	14 22.9	3 42 10.79	17 52 32.9	0.3	1.3	0.09	25	11 17.2	3 37 19.26	17 35 36.9	0.3	1.3	0.09
11	14 18.9	3 42 5.81	+17 52 14.2	0.3	1.3	0.09	26	11 13.2	3 37 12.41	+17 35 14.3	0.3	1.3	0.09
12	14 14.9	3 42 0.73	17 51 55.3	0.3	1.3	0.09	27	11 9.1	3 37 5.59	17 34 51.8	0.3	1.3	0.09
13	14 10.9	3 41 55.57	17 51 36.2	0.3	1.3	0.09	28	11 5.1	3 36 58.80	17 34 29.5	0.3	1.3	0.09
14	14 6.8	3 41 50.32	17 51 16.8	0.3	1.3	0.09	29	11 1.0	3 36 52.05	17 34 7.4	0.3	1.3	0.09
15	14 2.8	3 41 44.98	17 50 57.2	0.3	1.3	0.09	30	10 57.0	3 36 45.34	17 33 45.5	0.3	1.3	0.09
16	13 58.8	3 41 39.55	+17 50 37.3	0.3	1.3	0.09	Dec. 1	10 53.0	3 36 38.65	+17 33 23.7	0.3	1.3	0.09
17	13 54.8	3 41 34.03	17 50 17.2	0.3	1.3	0.09	2	10 48.9	3 36 32.00	17 33 2.1	0.3	1.3	0.09
18	13 50.8	3 41 28.42	17 49 56.8	0.3	1.3	0.09	3	10 44.9	3 36 25.38	17 32 40.6	0.3	1.3	0.09
19	13 46.7	3 41 22.75	17 49 36.2	0.3	1.3	0.09	4	10 40.8	3 36 18.80	17 32 19.3	0.3	1.3	0.09
20	13 42.7	3 41 17.00	17 49 15.4	0.3	1.3	0.09	5	10 36.8	3 36 12.26	17 31 58.3	0.3	1.3	0.09
21	13 38.7	3 41 11.17	+17 48 54.4	0.3	1.3	0.09	6	10 32.7	3 36 5.78	+17 31 37.4	0.3	1.3	0.09
22	13 34.6	3 41 5.28	17 48 33.2	0.3	1.3	0.09	7	10 28.7	3 35 59.35	17 31 16.8	0.3	1.3	0.09
23	13 30.6	3 40 59.31	17 48 11.8	0.3	1.3	0.09	8	10 24.7	3 35 52.98	17 30 56.5	0.3	1.3	0.09
24	13 26.6	3 40 53.27	17 47 50.3	0.3	1.3	0.09	9	10 20.6	3 35 46.66	17 30 36.3	0.3	1.3	0.09
25	13 22.6	3 40 47.16	17 47 28.5	0.3	1.3	0.09	10	10 16.6	3 35 40.40	17 30 16.4	0.3	1.3	0.09
26	13 18.5	3 40 40.98	+17 47 6.6	0.3	1.3	0.09	11	10 12.6	3 35 34.20	+17 29 56.8	0.3	1.3	0.09
27	13 14.5	3 40 34.74	17 46 44.5	0.3	1.3	0.09	12	10 8.5	3 35 28.05	17 29 37.4	0.3	1.3	0.09
28	13 10.4	3 40 28.45	17 46 22.3	0.3	1.3	0.09	13	10 4.5	3 35 21.96	17 29 18.2	0.3	1.3	0.09
29	13 6.4	3 40 22.11	17 45 59.9	0.3	1.3	0.09	14	10 0.5	3 35 15.95	17 28 59.4	0.3	1.3	0.09
30	13 2.4	3 40 15.72	17 45 37.4	0.3	1.3	0.09	15	9 56.4	3 35 10.01	17 28 40.9	0.3	1.3	0.09
31	12 58.3	3 40 9.27	+17 45 14.8	0.3	1.3	0.09	16	9 52.4	3 35 4.15	+17 28 22.7	0.3	1.3	0.09
Nov. 1	12 54.3	3 40 2.77	17 44 52.1	0.3	1.3	0.09	17	9 48.4	3 34 58.36	17 28 4.8	0.3	1.3	0.09
2	12 50.3	3 39 56.22	17 44 29.3	0.3	1.3	0.09	18	9 44.3	3 34 52.64	17 27 47.2	0.3	1.3	0.09
3	12 46.2	3 39 49.63	17 44 6.4	0.3	1.3	0.09	19	9 40.3	3 34 47.00	17 27 29.9	0.3	1.3	0.09
4	12 42.2	3 39 43.00	17 43 43.4	0.3	1.3	0.09	20	9 36.3	3 34 41.43	17 27 12.9	0.3	1.3	0.09
5	12 38.1	3 39 36.34	+17 43 20.3	0.3	1.3	0.09	21	9 32.3	3 34 35.95	+17 26 56.2	0.3	1.3	0.09
6	12 34.1	3 39 29.64	17 42 57.2	0.3	1.3	0.09	22	9 28.3	3 34 30.56	17 26 39.9	0.3	1.3	0.09
7	12 30.1	3 39 22.92	17 42 34.0	0.3	1.3	0.09	23	9 24.2	3 34 25.26	17 26 24.0	0.3	1.3	0.09
8	12 26.0	3 39 16.16	17 42 10.8	0.3	1.3	0.09	24	9 20.2	3 34 20.06	17 26 8.5	0.3	1.3	0.09
9	12 22.0	3 39 9.37	17 41 47.5	0.3	1.3	0.09	25	9 16.2	3 34 14.95	17 25 53.2	0.3	1.3	0.09
10	12 17.9	3 39 2.55	+17 41 24.2	0.3	1.3	0.09	26	9 12.2	3 34 9.93	+17 25 38.4	0.3	1.3	0.09
11	12 13.9	3 33 55.70	17 41 0.8	0.3	1.3	0.09	27	9 8.2	3 34 5.00	17 25 23.9	0.3	1.3	0.09
12	12 9.8	3 38 48.84	17 40 37.4	0.3	1.3	0.09	28	9 4.2	3 34 0.16	17 25 9.9	0.3	1.3	0.09
13	12 5.8	3 38 41.98	17 40 14.0	0.3	1.3	0.09	29	9 0.1	3 33 55.43	17 24 56.2	0.3	1.3	0.09
14	12 1.7	3 38 35.10	17 39 50.7	0.3	1.3	0.09	30	8 56.1	3 33 50.81	17 24 42.9	0.3	1.3	0.09
15	11 57.7	3 38 28.21	+17 39 27.4	0.3	1.3	0.09	31	8 52.1	3 33 46.29	+17 24 30.1	0.3	1.3	0.09
16	11 53.6	3 38 21.31	+17 39 4.1	0.3	1.3	0.09	32	8 48.1	3 33 41.89	+17 24 17.6	0.3	1.3	0.09

PART III

PHENOMENA

ECLIPSES IN 1886.

In the year 1886 there will be two eclipses, both of the sun.

I.—*An Annular Eclipse of the Sun*, 1886, March 5, visible at Washington as a partial eclipse.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, March $5^{d}\ 10^{h}\ 8^{m}\ 56^{s}.4$

Sun and moon's R. A.	$23^{h}\ 5^{m}\ 50^{s}.3$	Hourly motions	$9^{s}.28$ and $115^{s}.82$
Sun's declination	$5^{\circ}\ 47'\ 58''.6$ S.	Hourly motion	$0'\ 58''.1$ N.
Moon's declination	5 42 29.3 S.	Hourly motion	9 3.9 N.
Sun's equa. hor. parallax	8.9	Sun's true semidiameter	16 7.0
Moon's equa. hor. parallax	54 29.6	Moon's true semidiameter	14 50.2

CIRCUMSTANCES OF THE ECLIPSE.

		d	h	m		°	′			°	′	
Eclipse begins	March	5	7	1.1	in long.	166	13.2	E.	and in lat.	13	27.9	S.
Central eclipse begins		5	8	8.3		149	37.1	E.		11	28.6	S.
Central eclipse at noon		5	10	8.9		149	20.9	W.		0	0.2	S.
Central eclipse ends		5	12	2.5		90	9.4	W.		22	31.5	N.
Eclipse ends		5	13	9.7		106	43.5	W.		20	32.6	N.

II.—*A Total Eclipse of the Sun*, 1886, August 28–29, visible at Washington as a partial eclipse.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, August $29^{d}\ 0^{h}\ 58^{m}\ 32^{s}.5$

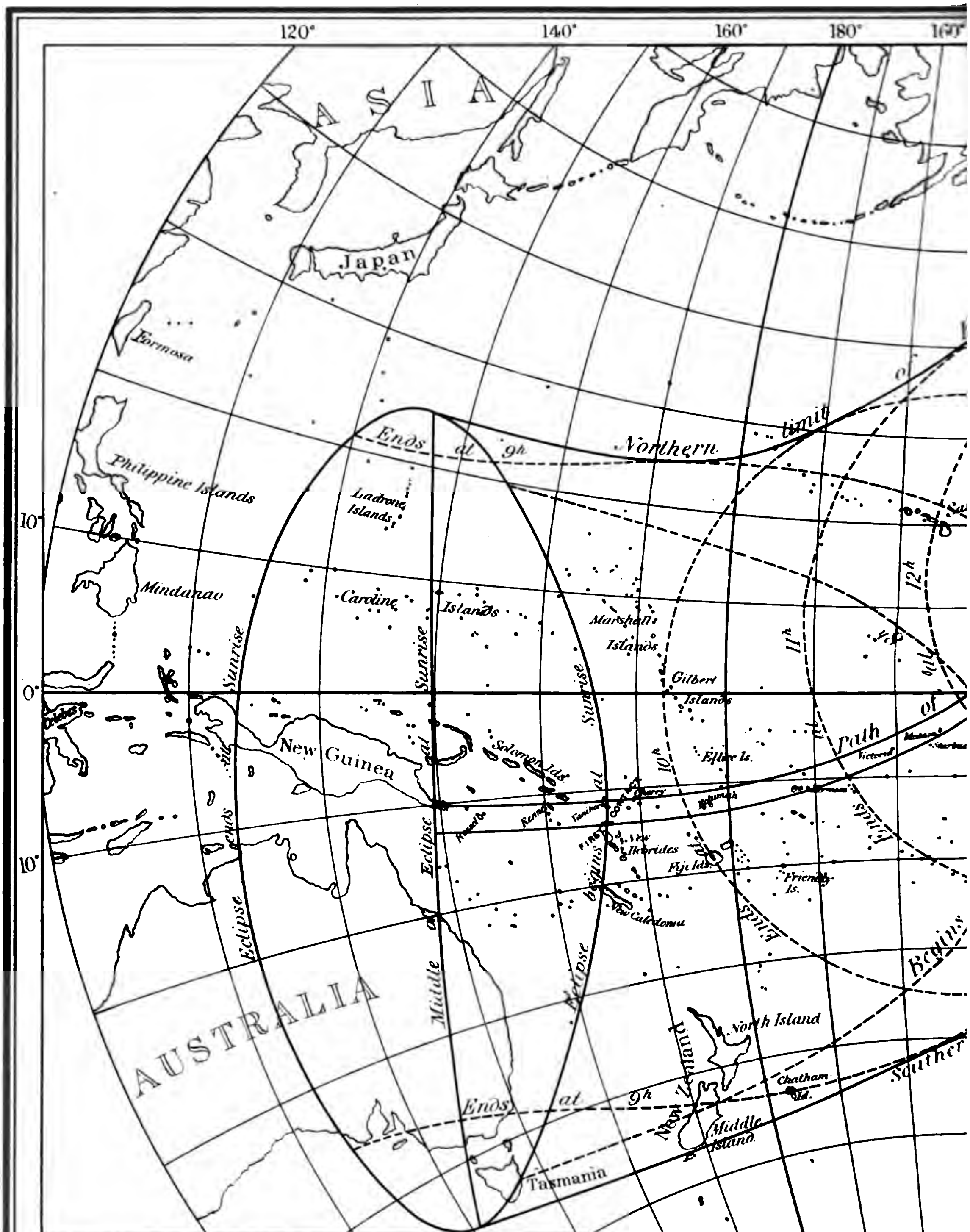
Sun and moon's R. A.	$10^{h}\ 31^{m}\ 23^{s}.52$	Hourly motions	$9^{s}.12$ and $148^{s}.37$
Sun's declination	$9^{\circ}\ 17'\ 23''.8$ N.	Hourly motion	$0'\ 53''.5$ S.
Moon's declination	9 10 38.5 N.	Hourly motion	10 43.7 S.
Sun's equa. hor. parallax	8.8	Sun's true semidiameter	15 50.8
Moon's equa. hor. parallax	61 21.7	Moon's true semidiameter	16 42.4

CIRCUMSTANCES OF THE ECLIPSE.

		d	h	m		°	′			°	′	
Eclipse begins	August	28	22	18.4	in long.	66	23.2	W.	and in lat.	11	54.0	N.
Central eclipse begins		28	23	13.3		79	44.4	W.		9	48.2	N.
Central eclipse at noon		29	0	58.5		14	26.6	W.		2	58.5	N.
Central eclipse ends		29	2	37.5		47	2.3	E.		21	54.0	S.
Eclipse ends		29	3	32.4		33	43.0	E.		19	48.4	S.

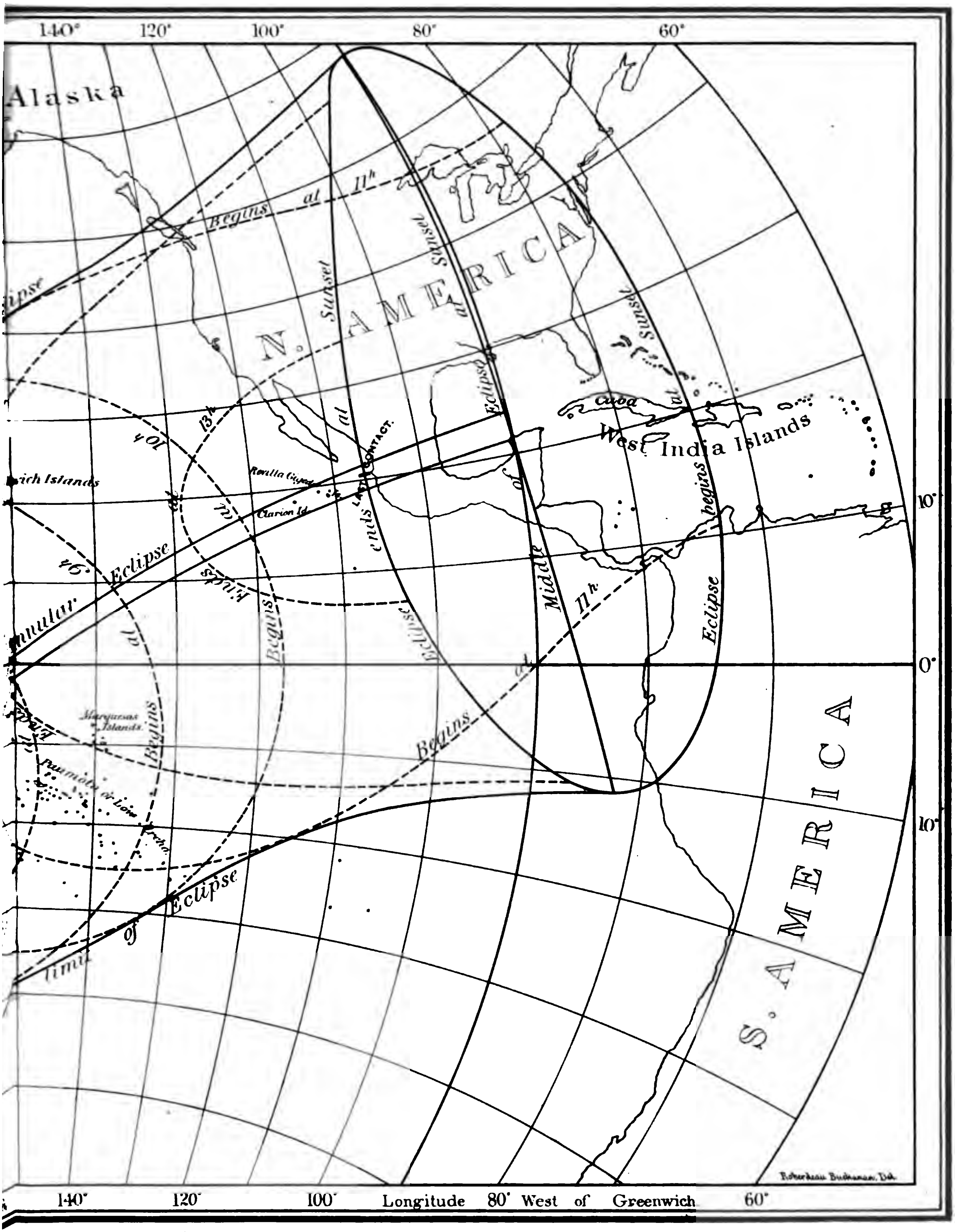
The regions within which these eclipses of the sun are visible are laid down on the following charts, from which may also be found the Greenwich time of beginning or ending within fifteen or twenty minutes, by means of the dotted lines.

ANNULAR ECLIP



Note.- *The hours of beginning and endin*

E OF MARCH 5TH. 1886.



... are expressed in Greenwich Mean Time.

BESSELIAN ELEMENTS OF THE ANNULAR ECLIPSE OF THE SUN, 1886, MARCH 5.

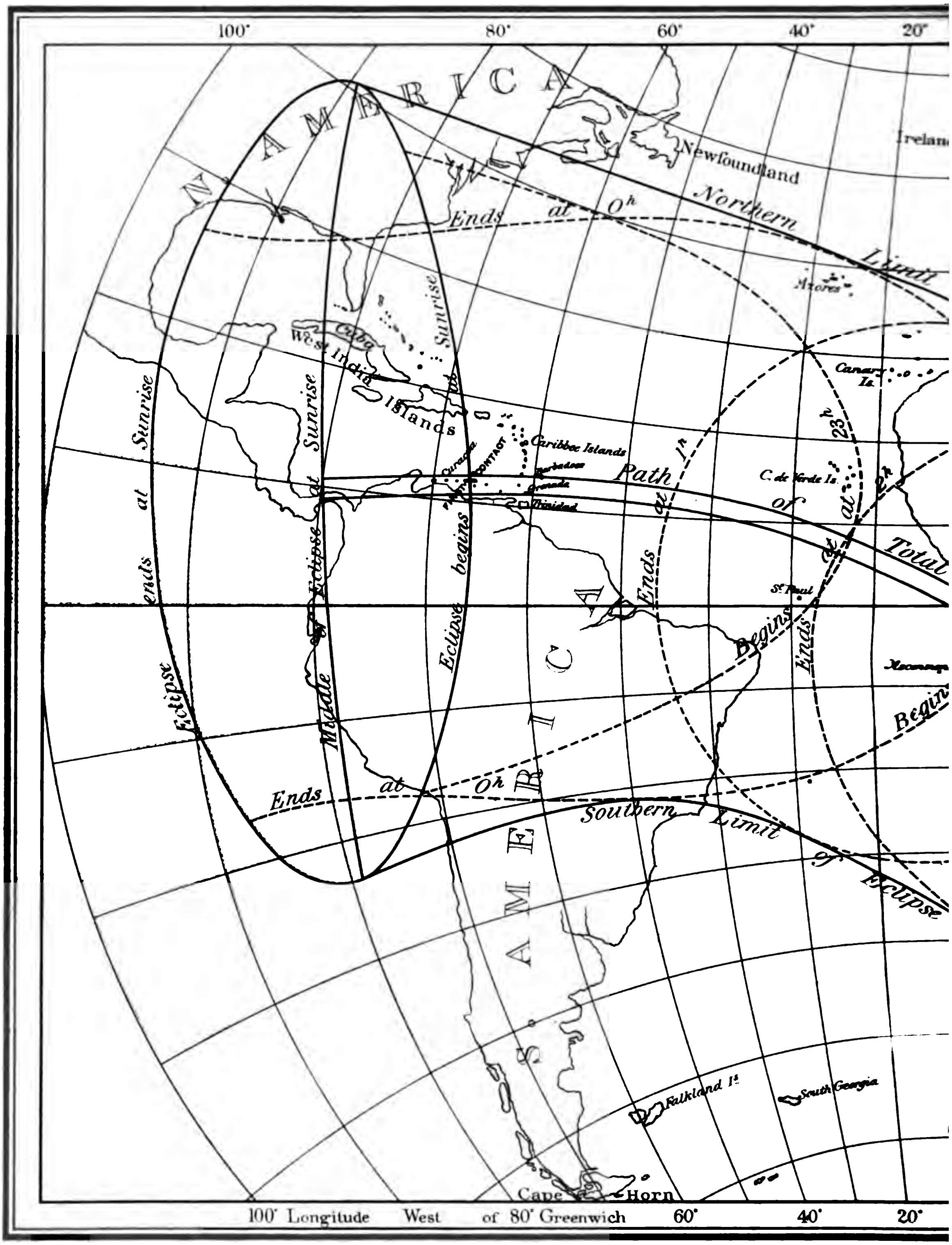
Greenwich Mean Time.	Co-ordinates of Centre of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	x	*y*	Log sin *d*	Log cos *d*	*μ*	*l*	*l′*
h m					° ′		
7 0	−1.53540	−0.36779	−9.00824	+9.99773	102 6.2	+0.56973	+0.02374
10	1.45415	0.34300	9.00804	9.99774	104 36.2	0.56972	0.02373
20	1.37290	0.31821	9.00785	9.99774	107 6.2	0.56971	0.02372
30	1.29165	0.29342	9.00765	9.99774	109 36.3	0.56969	0.02371
40	1.21040	0.26862	9.00746	9.99774	112 6.3	0.56968	0.02370
50	1.12914	0.24382	9.00726	9.99774	114 36.3	0.56967	0.02369
8 0	−1.04788	−0.21901	−9.00707	+9.99775	117 6.4	+0.56966	+0.02368
10	0.96661	0.19421	9.00687	9.99775	119 36.4	0.56965	0.02367
20	0.88534	0.16940	9.00668	9.99775	122 6.4	0.56964	0.02366
30	0.80407	0.14459	9.00649	9.99775	124 36.5	0.56963	0.02364
40	0.72281	0.11978	9.00629	9.99775	127 6.5	0.56962	0.02363
50	0.64154	0.09496	9.00610	9.99776	129 36.5	0.56961	0.02362
9 0	−0.56027	−0.07014	−9.00591	+9.99776	132 6.6	+0.56960	+0.02361
10	0.47901	0.04532	9.00571	9.99776	134 36.6	0.56959	0.02360
20	0.39774	−0.02050	9.00551	9.99776	137 6.7	0.56958	0.02359
30	0.31647	+0.00433	9.00532	9.99776	139 36.7	0.56956	0.02357
40	0.23521	0.02915	9.00512	9.99777	142 6.7	0.56955	0.02356
50	0.15394	0.05397	9.00492	9.99777	144 36.8	0.56954	0.02355
10 0	−0.07266	+0.07880	−9.00473	+9.99777	147 6.8	+0.56953	+0.02354
10	+0.00861	0.10363	9.00453	9.99777	149 36.8	0.56952	0.02353
20	0.08988	0.12846	9.00433	9.99777	152 6.9	0.56951	0.02352
30	0.17116	0.15329	9.00414	9.99778	154 36.9	0.56949	0.02350
40	0.25244	0.17812	9.00394	9.99778	157 6.9	0.56948	0.02349
50	0.33372	0.20295	9.00374	9.99778	159 37.0	0.56947	0.02348
11 0	+0.41499	+0.22778	−9.00355	+9.99778	162 7.0	+0.56946	+0.02347
10	0.49626	0.25262	9.00335	9.99778	164 37.1	0.56944	0.02346
20	0.57753	0.27746	9.00315	9.99779	167 7.1	0.56943	0.02345
30	0.65880	0.30230	9.00296	9.99779	169 37.1	0.56942	0.02344
40	0.74007	0.32714	9.00276	9.99779	172 7.2	0.56940	0.02342
50	0.82134	0.35199	9.00256	9.99779	174 37.2	0.56939	0.02341
12 0	+0.90261	+0.37683	−9.00237	+9.99779	177 7.2	+0.56938	+0.02340
10	0.98387	0.40168	9.00217	9.99780	179 37.3	0.56937	0.02338
20	1.06513	0.42652	9.00197	9.99780	182 7.3	0.56936	0.02337
30	1.14639	0.45137	9.00178	9.99780	184 37.3	0.56935	0.02336
40	1.22764	0.47622	9.00158	9.99780	187 7.4	0.56933	0.02334
50	1.30890	0.50107	9.00138	9.99780	189 37.4	0.56932	0.02333
13 0	+1.09015	+0.52592	−9.00118	+9.99781	192 7.4	+0.56931	+0.02332
10	+1.47140	+0.55077	−9.00099	+9.99781	194 37.5	+0.56929	+0.02330

Greenwich Mean Time.	Log Δ *x* for 1 Minute.	Log Δ *y* for 1 Minute.	Log Δ *μ* for 1 Minute.	Log Tangents of Angles of Cones—	
				Penumbra.	Shadow.
h m					
7 0	+7.9098	+7.3942	+1.1762	+7.67321	+7.67110
8 0	7.9099	7.3945	1.1762	7.67321	7.67110
9 0	7.9099	7.3948	1.1762	7.67320	7.67109
10 0	7.9099	7.3949	1.1762	7.67320	7.67109
11 0	7.9100	7.3951	1.1762	7.67319	7.67108
12 0	7.9099	7.3952	1.1762	7.67319	7.67108
13 0	7.9098	7.3954	1.1762	7.67318	7.67107
14 0	+7.9097	+7.3955	+1.1762	+7.67318	+7.67107

PATH OF ANNULUS DURING THE ANNULAR ECLIPSE OF THE SUN, 1886, MARCH 5.

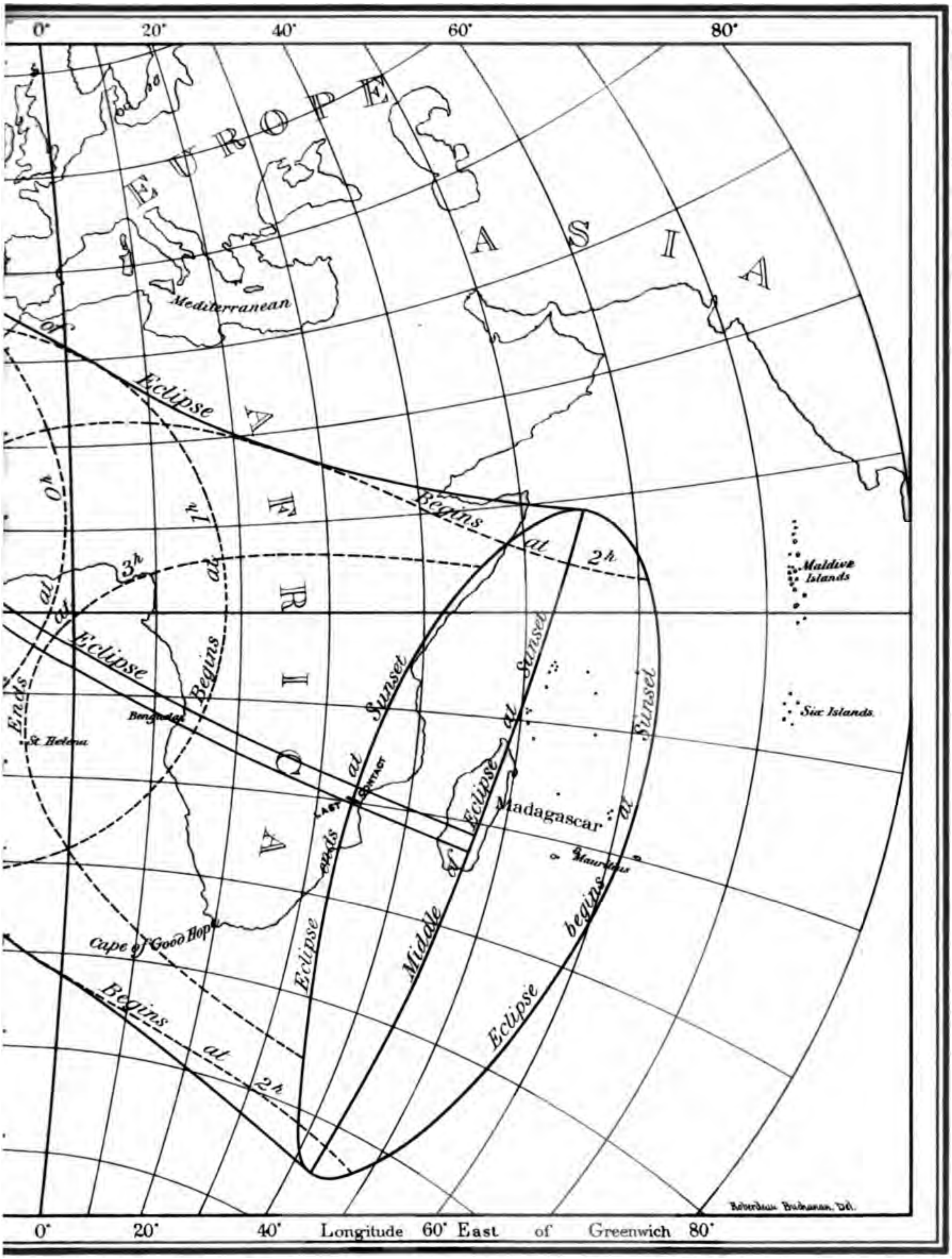
Greenwich Mean Time.	Northern Limit of Annulus Path.		Central Line.		Southern Limit of Annulus Path.		Duration of Annulus on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
	° ′	° ′	° ′	° ′	° ′	° ′	m s
Limits	−10 5.9	149 43.5 E.	−11 28.6	149 37.1 E.	−12 48.7	149 30.0 E.	
8^h 10^m	10 52.0	158 33.5	12 12.5	158 57.9	13 33.1	159 22.4	5 53.1
15	11 11.5	167 18.7	12 27.8	167 40.0	13 44.2	168 1.4	6 14.1
20	11 6.9	172 32.9	12 20.9	172 54.7	13 34.9	173 16.5	6 29.1
25	10 53.4	176 31.4	12 5.5	176 54.2 E.	13 17.6	177 17.1 E.	6 41.8
30	−10 34.7	179 47.3 E.	−11 45.1	179 48.7 W.	−12 55.6	179 24.7 W.	6 53.1
35	10 12.5	177 24.5 W.	11 21.4	176 59.3	12 30.4	176 34.2	7 3.5
40	9 47.6	174 56.5	10 55.2	174 30.3	12 2.8	174 4.1	7 13.0
45	9 20.6	172 43.8	10 26.9	172 16.6	11 33.2	171 49.4	7 21.8
50	8 51.9	170 42.9	9 57.0	170 14.8	11 2.1	169 46.6	7 30.0
55	8 21.6	168 51.9	9 25.7	168 22.9	10 29.7	167 53.9	7 37.5
9 0	− 7 50.1	167 9.0	− 8 53.1	166 39.2	− 9 56.1	166 9.4	7 44.4
5	7 17.4	165 32.8	8 19.4	165 2.3	9 21.4	164 31.8	7 50.7
10	6 43.7	164 2.3	7 44.8	163 31.1	8 45.8	163 0.0	7 56.4
15	6 9.0	162 36.5	7 9.3	162 4.8	8 9.5	161 33.0	8 1.6
20	5 33.5	161 14.9	6 32.9	160 42.6	7 32.3	160 10.3	8 6.1
25	4 57.1	159 56.9	5 55.7	159 24.1	6 54.4	158 51.2	8 10.1
30	− 4 19.9	158 41.8	− 5 17.8	158 8.6	− 6 15.8	157 35.3	8 13.5
35	3 42.0	157 29.4	4 39.2	156 55.7	5 36.5	156 22.0	8 16.3
40	3 3.3	156 19.1	4 0.0	155 45.0	4 56.6	155 10.9	8 18.6
45	2 23.9	155 10.5	3 20.1	154 36.1	4 16.2	154 1.6	8 20.3
50	1 43.9	154 3.4	2 39.6	153 28.7	3 35.3	152 53.9	8 21.5
55	1 3.1	152 57.4	1 58.4	152 22.4	2 53.7	151 47.3	8 22.1
10 0	− 0 21.6	151 52.1	− 1 16.5	151 16.9	− 2 11.5	150 41.6	8 22.2
5	+ 0 20.6	150 47.4	− 0 34.1	150 11.9	1 28.7	149 36.5	8 21.8
10	1 3.5	149 42.9	+ 0 9.0	149 7.2	0 45.4	148 31.6	8 20.8
15	1 47.0	148 38.3	0 52.7	148 2.5	− 0 1.6	147 26.6	8 19.3
20	2 31.3	147 33.3	1 37.1	146 57.4	+ 0 42.9	146 21.4	8 17.4
25	3 16.3	146 27.7	2 22.1	145 51.6	1 27.9	145 15.5	8 15.0
30	+ 4 2.1	145 20.9	+ 3 7.8	144 44.7	+ 2 13.6	144 8.6	8 12.1
35	4 48.7	144 12.7	3 54.3	143 36.5	2 59.9	143 0.4	8 8.7
40	5 36.0	143 2.8	4 41.4	142 26.6	3 46.8	141 50.4	8 4.9
45	6 24.3	141 50.7	5 29.4	141 14.6	4 34.5	140 38.4	8 0.7
50	7 13.5	140 36.0	6 18.2	139 59.9	5 23.0	139 23.8	7 56.0
55	8 3.6	139 18.2	7 7.9	138 42.1	6 12.2	138 6.1	7 50.8
11 0	+ 8 54.7	137 56.6	+ 7 58.5	137 20.7	+ 7 2.2	136 44.8	7 45.3
5	9 46.9	136 30.5	8 50.1	135 54.8	7 53.2	135 19.1	7 39.4
10	10 40.4	134 59.1	9 42.9	134 23.6	8 45.3	133 48.2	7 33.0
15	11 35.3	133 21.0	10 36.9	132 45.9	9 38.5	132 10.7	7 26.2
20	12 31.8	131 35.1	11 32.4	131 0.4	10 33.1	130 25.7	7 18.9
25	13 29.8	129 39.7	12 29.4	129 5.5	11 29.0	128 31.4	7 11.2
30	+14 29.8	127 32.5	+13 28.2	126 59.1	+12 26.6	126 25.7	7 3.0
35	15 32.3	125 10.1	14 29.3	124 37.6	13 26.3	124 5.1	6 54.2
40	16 37.7	122 28.2	15 33.1	121 56.9	14 28.5	121 25.6	6 44.7
45	17 46.9	119 18.1	16 40.5	118 48.5	15 34.0	118 18.6	6 34.5
50	19 1.7	115 26.7	17 53.0	114 59.5	16 44.3	114 32.3	6 23.1
55	20 25.2	110 23.4	19 13.5	110 0.5	18 1.9	109 37.5	6 9.8
12 0	+22 25.2	102 20.9	+21 8.7	102 11.0	+19 52.3	102 1.1	5 52.2
Limits	+23 53.9	90 17.7 W.	+22 31.5	90 9.4 W.	+21 11.4	90 2.3 W.	

TOTAL ECLIPSE



Note.- *The hours of beginning and ending*

AUGUST 28-9TH 1886.



re expressed in Greenwich Mean Time.

BESSELIAN ELEMENTS OF THE TOTAL ECLIPSE OF THE SUN, 1886, AUGUST 28—29.

Greenwich Mean Time.	Co-ordinates of Centre of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	x	y	Log sin d	Log cos d	μ	l	l'
h m					° ′		
22 20	−1.48343	+0.31386	+9.20977	+9.99422	334 47.8	+0.53166	−0.01414
30	1.38988	0.28713	9.20965	9.99422	337 17.8	0.53168	0.01413
40	1.29633	0.26040	9.20954	9.99422	339 47.8	0.53169	0.01412
50	1.20278	0.23366	9.20943	9.99423	342 17.9	0.53170	0.01411
23 0	−1.10922	+0.20692	+9.20932	+9.99423	344 47.9	+0.53171	−0.01410
10	1.01566	0.18017	9.20921	9.99423	347 18.0	0.53172	0.01409
20	0.92209	0.15342	9.20910	9.99424	349 48.0	0.53173	0.01408
30	0.82852	0.12666	9.20898	9.99424	352 18.1	0.53174	0.01407
40	0.73495	0.09991	9.20887	9.99424	354 48.1	0.53175	0.01406
50	0.64138	0.07315	9.20876	9.99424	357 18.2	0.53176	0.01405
0 0	−0.54780	+0.04639	+9.20865	+9.99425	359 48.2	+0.53176	−0.01405
10	0.45423	+0.01962	9.20854	9.99425	2 18.2	0.53177	0.01405
20	0.36065	−0.00714	9.20843	9.99425	4 48.3	0.53177	0.01404
30	0.26707	0.03391	9.20831	9.99426	7 18.3	0.53177	0.01404
40	0.17349	0.06068	9.20820	9.99426	9 48.4	0.53178	0.01404
50	−0.07992	0.08746	9.20809	9.99426	12 18.4	0.53178	0.01403
1 0	+0.01365	−0.11424	+9.20798	+9.99427	14 48.5	+0.53178	−0.01403
10	0.10722	0.14103	9.20787	9.99427	17 18.5	0.53178	0.01403
20	0.20078	0.16782	9.20776	9.99427	19 48.6	0.53178	0.01403
30	0.29434	0.19461	9.20764	9.99427	22 18.6	0.53178	0.01403
40	0.38790	0.22140	9.20753	9.99428	24 48.6	0.53178	0.01403
50	0.48146	0.24820	9.20742	9.99428	27 18.7	0.53178	0.01403
2 0	+0.57501	−0.27500	+9.20731	+9.99428	29 48.7	+0.53178	−0.01403
10	0.66857	0.30180	9.20720	9.99429	32 18.8	0.53177	0.01404
20	0.76212	0.32861	9.20708	9.99429	34 48.8	0.53177	0.01404
30	0.85567	0.35541	9.20697	9.99429	37 18.9	0.53177	0.01404
40	0.94921	0.38222	9.20686	9.99430	39 48.9	0.53176	0.01405
50	1.04275	0.40903	9.20675	9.99430	42 19.0	0.53175	0.01405
3 0	+1.13629	−0.43584	+9.20664	+9.99430	44 49.0	+0.53175	−0.01406
10	1.22982	0.46265	9.20652	9.99430	47 19.0	0.53174	0.01406
20	1.32335	0.48947	9.20641	9.99431	49 49.1	0.53174	0.01407
30	1.41687	0.51628	9.20630	9.99431	52 19.1	0.53173	0.01408
40	+1.51039	−0.54310	+9.20618	+9.99431	54 49.2	+0.53172	−0.01409

Greenwich Mean Time.	Log Δ x for 1 Minute.	Log Δ y for 1 Minute.	Log Δ μ for 1 Minute.	Log Tangents of Angles of Cones—	
				Penumbra.	Shadow.
h m					
22 0	+7.9710	−7.4269	+1.1762	+7.66573	+7.66362
23 0	7.9711	7.4272	1.1762	7.66574	7.66363
0 0	7.9712	7.4275	1.1762	7.66574	7.66363
1 0	7.9711	7.4279	1.1762	7.66575	7.66364
2 0	7.9711	7.4281	1.1762	7.66575	7.66364
3 0	7.9710	7.4283	1.1762	7.66576	7.66365
4 0	+7.9709	−7.4285	+1.1762	+7.66576	+7.66365

PATH OF THE SHADOW DURING THE TOTAL ECLIPSE OF THE SUN, 1886, AUGUST 28—29.

Greenwich Mean Time.	Northern Limit of Shadow Path.		Central Line.		Southern Limit of Shadow Path.		Duration of Shadow on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
	° ′	° ′	° ′	° ′	° ′	° ′	m s
Limits	+10 36.5	79 51.8 W.	+ 9 48.2	79 44.4 W.	+ 8 59.9	79 37.0 W.	
23^h 15^m	12 8.8	69 26.7	11 16.0	69 35.2	10 23.2	69 43.6	3 22.0
20	13 2.8	60 14.5	12 8.0	60 22.2	11 13.2	60 29.9	3 49.9
25	13 19.1	54 32.2	12 22.9	54 41.5	11 26.7	54 50.7	4 10.9
30	+13 20.5	50 7.7	+12 23.3	50 18.7	+11 26.1	50 29.8	4 28.6
35	13 13.5	46 25.6	12 15.6	46 40.3	11 17.7	46 53.1	4 44.3
40	13 0.2	43 16.1	12 1.8	43 30.5	11 3.3	43 45.0	4 58.5
45	12 42.3	40 26.3	11 43.4	40 42.3	10 44.5	40 58.3	5 11.5
50	12 20.7	37 51.8	11 21.5	38 9.3	10 22.4	38 26.8	5 23.4
55	11 55.9	35 30.3	10 56.6	35 49.3	9 57.3	36 8.2	5 34.3
0 0	+11 28.6	33 19.0	+10 29.2	33 39.3	+ 9 29.8	33 59.6	5 44.3
5	10 58.8	31 16.3	9 59.5	31 37.8	9 0.1	31 59.4	5 53.3
10	10 27.0	29 20.5	9 27.7	29 43.3	8 28.5	30 6.0	6 1.4
15	9 53.3	27 30.7	8 54.2	27 54.6	7 55.0	28 18.4	6 8.6
20	9 17.9	25 45.9	8 18.9	26 10.8	7 19.9	26 35.6	6 14.9
25	8 40.8	24 5.3	7 42.0	24 31.1	6 43.3	24 56.9	6 20.3
30	+ 8 2.2	22 28.3	+ 7 3.7	22 55.0	+ 6 5.2	23 21.6	6 24.8
35	7 22.2	20 54.2	6 23.9	21 21.7	5 25.7	21 49.1	6 28.3
40	6 40.7	19 22.6	5 42.8	19 50.8	4 44.8	20 19.0	6 31.0
45	5 57.9	17 53.0	5 0.3	18 21.8	4 2.6	18 50.6	6 32.7
50	5 13.8	16 24.8	4 16.5	16 54.2	3 19.2	17 23.6	6 33.6
55	4 28.3	14 57.7	3 31.3	15 27.6	2 34.3	15 57.5	6 33.6
1 0	+ 3 41.5	13 31.2	+ 2 44.9	14 1.5	+ 1 48.2	14 31.8	6 32.7
5	2 53.4	12 4.8	1 57.1	12 35.5	1 0.8	13 6.1	6 31.0
10	2 4.0	10 38.2	1 8.0	11 9.1	+ 0 12.0	11 40.1	6 28.4
15	1 13.3	9 10.8	+ 0 17.6	9 42.0	− 0 38.1	10 13.1	6 25.0
20	+ 0 21.1	7 42.3	− 0 34.2	8 13.5	1 29.6	8 44.8	6 20.8
25	− 0 32.5	6 12.0	1 27.5	6 43.3	2 22.6	7 14.7	6 15.8
30	− 1 27.6	4 39.3	− 2 22.4	5 10.6	− 3 17.1	5 42.0	6 9.9
35	2 24.4	3 3.6	3 18.8	3 34.8	4 13.3	4 6.1	6 3.3
40	3 22.9	1 24.1 W.	4 17.1	1 55.2	5 11.2	2 26.2	5 56.0
45	4 23.4	0 20.1 E.	5 17.3	0 10.7 W.	6 11.1	0 41.5 W.	5 47.8
50	5 25.9	2 10.1	6 19.5	1 39.6 E.	7 13.1	1 9.2 E.	5 38.9
55	6 30.8	4 7.3	7 24.1	3 37.4	8 17.4	3 7.5	5 29.2
2 0	− 7 38.3	6 13.5	− 8 31.4	5 44.2	− 9 24.4	5 14.9	5 18.7
5	8 49.0	8 31.4	9 41.8	8 2.9	10 34.5	7 34.3	5 7.3
10	10 3.3	11 3.4	10 55.8	10 35.8	11 48.2	10 8.2	4 55.0
15	11 22.3	13 55.3	12 14.5	13 28.9	13 6.6	13 2.5	4 41.7
20	12 47.4	17 14.5	13 39.1	16 49.6	14 30.9	16 24.7	4 27.0
25	14 21.0	21 16.1	15 12.3	20 53.2	16 3.7	20 30.3	4 10.5
30	−16 8.4	26 27.2	−16 59.3	26 7.3	−17 50.1	25 47.5	3 51.1
35	18 27.6	34 33.9	19 17.9	34 20.4	20 8.1	34 6.8	3 25.3
Limits	−21 5.9	47 10.1 E.	−21 54.0	47 2.3 E.	−22 41.9	46 53.3 E.	

WASHINGTON MEAN TIME.

PHASES OF THE MOON.

New Moon.	d	h	m	First Quarter.	d	h	m	Full Moon.	d	h	m	Last Quarter.	d	h	m
January	4	14	35.5	January	12	19	16.2	January	19	14	36.6	January	26	8	23.1
February	3	10	6.4	February	11	9	38.0	February	18	1	6.8	February	25	0	3.1
March	5	4	56.1	March	12	20	9.0	March	19	11	28.4	March	26	17	36.0
April	3	21	22.4	April	11	3	35.8	April	17	21	50.9	April	25	12	7.2
May	3	10	34.3	May	10	9	12.4	May	17	8	38.9	May	25	6	27.9
June	1	20	47.1	June	8	14	18.5	June	15	20	30.6	June	23	23	26.6
July	1	4	58.4	July	7	20	9.9	July	15	10	0.7	July	23	14	13.1
July	30	12	17.7	August	6	3	58.0	August	14	1	16.0	August	22	2	33.6
August	28	19	46.1	September	4	14	47.3	September	12	17	42.1	September	20	12	47.6
September	27	4	10.4	October	4	5	25.2	October	12	10	15.7	October	19	21	32.6
October	26	14	7.2	November	2	23	57.0	November	11	1	58.3	November	18	5	32.2
November	25	2	10.3	December	2	21	16.8	December	10	16	22.0	December	17	13	30.9
December	24	16	46.5												

APOGEE, PERIGEE, AND GREATEST LIBRATION.

Apogee.	d	h	Perigee.	d	h	Greatest Libration.	d	h	m			d	h	m	
January	6	16.1	January	19	20.2	January	13	20	37	E.	January	25	22	19	W.
February	2	17.2	February	17	9.0	February	11	2	57	E.	February	23	6	18	W.
March	1	23.7	March	17	17.6	March	10	22	29	E.	March	23	12	0	W.
March	29	15.8	April	14	12.4	April	6	15	6	E.	April	20	9	44	W.
April	26	11.0	May	10	7.4	May	3	0	6	E.	May	17	16	27	W.
May	24	6.2	June	5	5.7	May	30	7	47	E.	June	13	1	53	W.
June	20	23.8	July	3	0.0	June	27	4	30	E.	July	9	19	34	W.
July	18	13.6	July	31	5.9	July	25	7	44	E.	August	6	13	2	W.
August	14	20.6	August	28	19.9	August	22	13	7	E.	September	3	16	20	W.
September	10	22.3	September	26	1.9	September	19	15	38	E.	October	1	21	52	W.
October	8	8.3	October	24	6.7	October	17	2	9	E.	October	30	0	36	W.
November	5	1.4	November	20	14.2	November	12	6	53	E.	November	26	18	13	W.
December	2	21.8	December	15	6.9	December	9	2	2	E.	December	23	14	45	W.
December	30	19.1													

FORMULÆ FOR THE LIBRATION OF THE MOON.

Put I, the inclination of the moon's equator to the ecliptic ($= 1° 28'.8$),

Ω, the mean longitude of the moon's ascending node, (see page 278), or the mean longitude of the descending node of the moon's equator,

C, the angle at the centre of the moon's disk made by a lunar meridian with the circle of declination, counted from north to east on the apparent disk,

λ, β, a', δ', the apparent longitude, latitude, right ascension, and declination of the moon, corrected for parallax,

λ', the selenocentric longitude of the earth, counted on the moon's equator from its descending node, Ω,

i, Δ, Ω', ☾, the quantities defined on page 276, where their values for the year are given.

The moon's libration in longitude and latitude may then be found, for any time, by means of the following formulæ, in connection with the tables given on pages 276 and 277: —

$$\left.\begin{aligned} \Delta\lambda &= -0'.57 \sin 2(\Omega - \lambda) \\ a &= \sin I \cos(\Omega - \lambda) \\ \tan B &= \tan I \sin(\Omega - \lambda) \\ \lambda' &= \lambda + \Delta\lambda + a\,b \end{aligned}\right\} \text{\textit{See table, page 277.}}$$

$$\text{The libration in latitude} = b = B - \beta$$

$$\text{The libration in longitude} = l = \lambda' - \text{☾}$$

$$\sin C = \sin i \frac{\cos(\lambda' + \Delta - \Omega)}{\cos \delta'} = -\sin i \frac{\cos(a' - \Omega')}{\cos b}$$

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
φ Ophiuchi	4½	-1.26	+10.9	-16 21.7	1 11 41.9	- 9 55.6	-0.3069	0.5524	-0.0801	+ 7	-54
24 Scorpii	5½	1.29	11.0	17 31.1	16 35.8	- 5 11.3	+0.5801	0.5526	0.0728	+60	- 2
29 Ophiuchi	6½	1.37	11.1	18 42.9	2 2 7.8	+ 4 2.0	+1.2642	0.5534	-0.0586	+72	+60
				NEW	*MOON.*						
β Capricorni	3	-1.25	+ 3.6	-15 18.4	6 1 27.0	+ 0 17.5	-1.1028	0.5414	+0.0882	-43	-90
B. A. C. 7063	6½	1.28	3.3	15 26.1	6 27.9	+ 5 9.1	-0.3152	0.5399	0.0947	+ 8	-54
τ^1 Capricorni	6½	1.29	3.0	15 32.4	9 33.0	+ 8 8.5	+0.0982	0.5390	0.0986	+31	-29
τ^2 Capricorni	5½	1.29	2.9	15 21.3	10 30.8	+ 9 4.5	-0.0111	0.5387	0.0997	+25	-35
Lalande 40522	6	1.29	2.0	14 55.4	20 15.6	- 5 28.6	+0.5357	0.5364	0.1110	+61	- 5
8 Aquarii	6½	-1.27	+ 1.8	-13 29.7	20 53·4	- 4 51.9	-0.9824	0.5360	+0.1119	-31	-90
9 Aquarii	6½	1.28	1.8	13 58.6	21 29.7	- 4 16.7	-0.3781	0.5359	0.1129	+ 6	-59
18 Aquarii	5½	1.27	0.8	13 22.0	7 9 10.6	+ 7 2.9	+0.3335	0.5328	0.1251	+48	-16
λ Capricorni	5½	1.27	+ 0.1	11 53.5	20 37.9	- 5 50.4	+0.1943	0.5301	0.1365	+41	-24
B. A. C. 7620	6½	1.23	- 0.1	10 50.4	8 0 17.3	- 2 17.4	-0.4608	0.5292	0.1393	+ 5	-64
B. A. C. 7774	6½	-1.13	- 1.0	- 9 36.5	12 20.9	+ 9 24.9	-0.0924	0.5270	+0.1493	+26	-40
Venus				10 13.9	13 5 0	+10 7.5	+0.7145	0.5056	0.1333	+80	+ 7
ρ Aquarii	5½	1.11	0.8	8 23.6	14 5.0	+11 5.9	-1.1784	0.5266	0.1506	-43	-90
67 Aquarii	6½	1.00	1.8	7 33.6	9 2 5.9	- 1 14.4	-0.2395	0.5247	0.1587	+19	-49
λ Aquarii	4	0.97	2.4	8 11.2	7 0.0	+ 3 31.1	+1.2388	0.5244	0.1615	+82	+46
78 Aquarii	6½	-0.96	- 2.5	- 7 48.6	8 1.5	+ 4 30.9	+0.9881	0.5242	+0.1621	+83	+23
B. A. C. 8017	6	0.90	2.1	5 19.5	11 41.0	+ 8 4.0	-1.1564	0.5240	0.1642	-38	-90
82 Aquarii	6½	0.91	2.7	7 11.2	12 12.4	+ 8 34.4	+0.9885	0.5240	0.1643	+83	+23
B. A. C. 8094	5½	0.80	2.5	4 7.0	19 3.0	- 8 46.9	-1.2644	0.5238	0.1675	-50	-90
96 Aquarii	5½	0.82	3.2	5 45.0	21 1.9	- 6 51.5	+0.8656	0.5237	0.1684	+85	+14
B. A. C. 8184	6	-0.76	- 3.4	- 5 9.4	10 2 20.7	- 1 42.0	+1.1133	0.5237	+0.1702	+85	+33
20 Piscium	5½	0.65	3.6	- 3 23.8	11 58.7	+ 7 39.1	+0.8356	0.5241	0.1734	+87	+12
44 Piscium	6	0.39	3.7	+ 1 18.4	11 7 24.9	+ 2 31.1	-0.8923	0.5274	0.1761	-16	-89
B. A. C. 237	6½	0.25	4.3	2 45.9	20 38.9	- 8 38.6	-0.1385	0.5309	0.1754	+27	-43
77 Piscium	6	0.14	4.4	4 18.0	12 3 58.1	- 1 32.7	-0.5106	0.5335	0.1742	+ 7	-67
ε Piscium	5½	-0.12	- 4.2	+ 5 2.7	5 15.8	- 0 17.4	-1.0849	0.5338	+0.1739	-30	-85
96 Piscium	6½	0.00	4.5	6 42.2	15 31.0	+ 9 38.9	-1.0877	0.5386	0.1707	-31	-84
μ Piscium	5	0.00	4.9	5 33.2	16 3.9	+10 10.8	+0.2331	0.5386	0.1706	+48	-21
64 Ceti	5½	+0.25	5.8	8 2.1	13 11 57.8	+ 5 26.9	+0.8927	0.5492	0.1602	+90	+19
ξ^1 Ceti	4	0.27	5.6	8 18.6	12 43.9	+ 6 11.4	+0.7252	0.5496	0.1596	+90	+ 8
ξ Arietis	5	+0.34	- 5.6	+10 5.5	18 15.6	+11 32.3	-0.2783	0.5534	+0.1557	+19	-48
B. A. C. 755	6½	0.34	5.6	10 3.0	19 10.0	-11 35.1	-0.0927	0.5535	0.1550	+29	-37
85 Ceti	6	0.43	6.2	10 15.2	14 2 25.8	- 4 33.9	+0.7955	0.5589	0.1486	+90	+14
38 Arietis	5	0.45	5.6	11 57.9	3 32.0	- 3 29.9	-0.7279	0.5595	0.1477	-12	-78
Lalande 5725	6	0.57	6.2	12 45.0	13 12.4	+ 5 50.8	-0.2573	0.5658	0.1381	+20	-44
48 Tauri	6	+0.92	- 7.8	+15 6.9	15 18 58.9	-10 33.1	+0.8596	0.5879	+0.0978	+90	+24
γ Tauri	4	0.94	7.9	15 21.1	20 38.4	-11 51.2	+0.7758	0.5895	0.0948	+90	+19
δ^1 Tauri	4	0.95	7.6	17 16.4	21 54.1	-10 38.4	-1.0520	0.5899	0.0929	-30	-73
63 Tauri	6	0.95	7.8	16 30.5	22 6.9	-10 26.0	-0.2566	0.5901	0.0927	+20	-39
δ^3 Tauri	5½	0.96	7.6	17 10.7	22 22.8	-10 10.7	+0.9116	0.5906	0.0919	-19	-73
70 Tauri	6	+0.96	- 8.1	+15 40.7	23 2.1	- 9 32.9	+0.6665	0.5907	+0.0911	+87	+13
71 Tauri	6	0.96	8.2	15 21.5	23 20.3	- 9 15.4	+1.0191	0.5911	0.0908	+90	+37
75 Tauri	6	0.99	7.4	16 6.2	16 0 11.3	- 8 26.3	+0.3406	0.5916	0.0892	+56	- 5
θ^1 Tauri	4	0.97	8.1	15 42.5	0 14.7	- 8 23.1	+0.7452	0.5916	0.0892	+90	+18
θ^2 Tauri	4	0.97	8.1	15 37.0	0 17.0	- 8 20.9	+0.8414	0.5916	0.0892	+90	+24
80 Tauri	6	+0.96	- 8.3	+15 23.2	0 53.7	- 7 45.6	+1.1293	0.5923	+0.0878	+90	+46
B. A. C. 1391	5	0.98	8.2	15 56.7	1 3.2	- 7 36.5	+0.5780	0.5923	0.0876	+76	+ 8
81 Tauri	6	0.97	8.3	15 26.6	1 5.9	- 7 33.9	+1.0884	0.5923	0.0876	+90	+43
85 Tauri	6½	0.98	8.3	15 36.3	1 35.5	- 7 5.4	+0.9670	0.5929	0.0864	+90	+33
α Tauri	1	1.01	8.2	16 16.7	3 14.0	- 5 30.6	+0.4257	0.5938	0.0840	+62	0
σ^1 Tauri	5	+1.00	- 8.5	+15 34.4	4 33.6	- 4 14.1	+1.2457	0.5947	+0.0812	+90	+61
σ^2 Tauri	5	+1.00	- 8.4	+15 41.4	4 36.3	- 4 11.5	+1.1329	0.5950	+0.0812	+90	+47

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
B. A. C. 1526	5	+1.09	− 8.7	+16 58.4	16 11 52.0	+ 2 47.4	+0.3798	0.5997	+0.0679	+59	− 1
m Tauri	5	1.13	8.6	18 29.4	15 48.9	+ 6 35.0	−0.8880	0.6022	0.0603	−20	−72
111 Tauri	5½	1.18	9.3	17 16.4	22 32.1	−10 57.8	+0.6885	0.6061	0.0466	+90	+19
115 Tauri	6	1.19	9.3	17 51.7	23 36.5	− 9 55.9	+0.1495	0.6068	0.0444	+44	−11
117 Tauri	6	1.18	9.5	17 8.5	23 57.5	− 9 35.7	+0.8820	0.6068	0.0439	+90	+31
119 Tauri	5	+1.21	− 9.5	+18 30.3	17 1 33.8	− 8 3.3	−0.4066	0.6077	+0.0403	+12	−44
B. A. C. 1728	6	1.20	9.7	16 58.1	1 36.3	− 8 1.0	+1.1254	0.6077	0.0402	+90	+51
120 Tauri	6	1.21	9.5	18 27.3	2 4.7	− 7 33.7	−0.3368	0.6080	0.0397	+16	−39
122 Tauri	6	1.21	9.8	16 57.9	3 28.5	− 6 13.3	+1.2006	0.6091	0.0363	+90	+59
127 Tauri	6	1.23	9.6	18 55.2	5 42.1	− 4 5.0	−0.6691	0.6099	0.0316	− 4	−65
130 Tauri	6	+1.24	− 9.9	+17 41.0	7 28.7	− 2 22.7	+0.6124	0.6109	+0.0276	+80	+16
71 Orionis	6	1.30	10.4	19 11.4	17 57.8	+ 7 40.7	−0.7061	0.6148	+0.0051	− 6	−68
26 Geminorum	5½	1.32	11.2	17 45.2	18 4 26.1	− 6 16.8	+0.6408	0.6177	−0.0189	+84	+18
λ Geminorum	4	1.36	11.9	16 44.6	17 54.8	+ 6 38.3	+1.1752	0.6190	0.0486	+90	+55
W. vii. 685	6	1.37	12.1	17 19.6	23 4.1	+11 34.7	+0.3227	0.6188	0.0598	+55	− 3
f Geminorum	6	+1.36	−12.2	+17 55.9	19 1 57.2	− 9 39.3	−0.4511	0.6184	−0.0661	+ 9	−49
1 Cancri	6	1.35	12.3	16 5.5	8 36.3	− 3 16.7	+0.8576	0.6173	0.0806	+90	+26
3 Cancri	6	1.36	12.3	17 37.0	10 1.2	− 1 55.4	−0.7467	0.6174	0.0833	− 8	−73
5 Cancri	6	1.36	12.3	16 46.0	10 18.2	− 1 39.1	+0.0586	0.6172	0.0836	+38	−20
29 Cancri	6	1.33	12.4	14 35.1	20 39.9	+ 8 17.0	+1.2117	0.6142	0.1047	+90	+54
54 Cancri	6	+1.29	−12.5	+15 46.2	20 5 16.5	− 7 27.3	−0.9143	0.6109	−0.1198	−19	−75
ξ Leonis	5	1.23	11.9	11 48.1	21 20.5	+ 7 58.2	+0.8191	0.6036	0.1455	+90	+17
18 Leonis	6	1.19	11.8	12 20.0	21 3 5.2	−10 30.7	−0.5604	0.6003	0.1533	+ 4	−66
A Leonis	4½	1.13	11.0	10 33.2	11 47.3	− 2 8.7	−0.1950	0.5956	0.1637	+24	−42
44 Leonis	6	1.08	10.4	9 21.6	18 53.9	+ 4 41.6	−0.2104	0.5913	0.1708	+23	−44
48 Leonis	5½	+1.06	− 9.9	+ 7 32.3	22 51.9	+ 8 30.7	+0.9053	0.5891	−0.1742	+90	+20
49 Leonis	6	1.05	10.2	9 14.2	22 56.9	+ 8 35.5	−0.7868	0.5891	0.1742	−10	−81
37 Sextantis	6	1.03	9.5	6 58.2	22 3 34.4	−10 57.3	+0.6386	0.5862	0.1778	+81	+ 2
56 Leonis	6½	1.00	9.2	6 47.5	7 45.0	− 6 55.9	+0.0678	0.5841	0.1805	+38	−29
c Leonis	5	0.98	9.0	6 42.8	9 44.8	− 5 0.6	−0.2152	0.5830	0.1818	+23	−46
τ Leonis	5	+0.90	−7.4	+ 3 29.0	21 23.5	+ 6 12.9	+0.8561	0.5765	−0.1868	+90	+14
89 Leonis	6	0.88	7.4	+ 3 41.5	23 0 11.3	+ 8 54.7	+0.1250	0.5751	0.1875	+42	−27
13 Virginis	6	0.73	4.5	− 0 9.3	19 43.0	+ 3 45.3	+0.3142	0.5659	0.1888	+54	−17
η Virginis	4	0.72	4.6	0 2.1	20 16.6	+ 4 17.7	+0.0879	0.5659	0.1887	+40	−30
JUPITER				1 4.0	24 0 47.9	+ 8 39.6	+0.2831	0.5649	0.1877	+52	−20
URANUS				− 2 21.3	3 5.3	+10 52.3	+1.1662	0.5637	−0.1878	+88	+36
γ Virginis	3	+0.66	− 3.6	0 49.6	6 6.4	−10 12.8	−0.9576	0.5623	0.1866	−21	−90
38 Virginis	6	0.57	2.8	2 56.0	11 19.3	− 5 10.5	+0.2270	0.5605	0.1848	+48	−22
k Virginis	6	0.56	2.1	3 11.9	14 16.0	− 2 19.7	−0.0427	0.5595	0.1837	+32	−37
46 Virginis	6	0.54	2.2	2 45.3	14 41.8	− 1 54.7	−0.5764	0.5591	0.1831	+ 3	−69
48 Virginis	6½	+0.53	− 1.9	− 3 3.0	16 12.7	− 0 26.9	−0.5513	0.5589	−0.1827	+ 4	−72
θ Virginis	4½	0.52	1.0	4 55.8	18 58.4	+ 2 13.2	+0.8800	0.5580	0.1813	+85	+15
65 Virginis	6	0.44	0.8	4 19.7	25 1 8.1	+ 8 10.6	−0.8476	0.5564	0.1780	−14	−90
66 Virginis	6	0.44	− 0.6	4 34.1	1 41.7	+ 8 43.1	−0.6998	0.5564	0.1775	− 5	−89
l^1 Virginis	6½	0.41	+ 0.1	5 52.8	4 24.7	+11 20.7	+0.1778	0.5556	0.1756	+44	−25
l^2 Virginis	5	+0.41	+ 0.1	− 5 40.1	5 8.1	−11 57.3	−0.1693	0.5555	−0.1755	+24	−45
88 Virginis	6½	0.34	0.9	6 16.1	12 43.1	− 4 37.4	−0.8578	0.5540	0.1700	−16	−90
B.A.C 4647 *mult*	6½	0.31	1.5	7 29.9	15 49.6	− 1 37.1	−0.0992	0.5535	0.1676	+27	−40
94 Virginis	6½	0.26	2.2	8 20.9	21 6.3	+ 3 29.2	−0.0838	0.5525	0.1632	+28	−39
95 Virginis	6	0.26	2.5	8 46.2	21 18.2	+ 3 40.7	+0.3265	0.5525	0.1631	+52	−17
96 Virginis	6½	+0.26	+ 2.9	− 9 47.6	22 21.7	+ 4 42.2	+1.2266	0.5525	−0.1624	+81	+45
κ Virginis	4	0.24	3.0	9 44.5	26 0 10.8	+ 6 27.7	+0.8798	0.5521	0.1606	+81	+16
ξ^1 Libræ	6	0.03	4.7	11 25.9	19 40.8	+ 1 19.5	−0.2745	0.5503	0.1407	+15	−51
ξ^2 Libræ	5½	+0.01	4.6	10 56.9	20 48.5	+ 2 25.0	−0.9477	0.5502	0.1394	−25	−90
γ Libræ	4½	−0.19	6.8	14 24.4	27 15 3.7	− 3 55.3	+0.3939	0.5498	0.1178	+51	−13
η Libræ	6	−0.23	+ 7.1	−15 18.4	19 5.6	− 0 1.3	+0.9003	0.5498	−0.1125	+75	+18
49 Libræ	6	−0.31	+ 7.6	−16 11.8	28 2 48.0	+ 7 26.1	+1.0245	0.5500	−0.1019	+74	+28

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0. Δα	Red'ns from 1886.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
JANUARY.											
φ Ophiuchi	4½	-0.48	+8.1	-16 21.8	28 17 20.1	- 2 30.1	-0.1123	0.5502	-0.0817	+17	-41
24 Scorpii	5½	0.53	8.5	17 31.2	22 14.7	+ 2 14.9	+0.7643	0.5503	-0.0744	+73	+10
B. A. C. 6294	5½	-1.03	+7.6	-18 28.7	31 2 22.1	+ 4 41.1	+0.0590	0.5490	+0.0079	+20	-31
FEBRUARY.											
ρ¹ Sagittarii	4	-1.18	+6.1	-18 3.6	1 2 31.6	+ 4 4.4	+0.2295	0.5463	+0.0450	+33	-22
ρ² Sagittarii	6½	1.18	6.1	18 31.1	2 35.6	+ 4 8.2	+0.7403	0.5465	0.0452	+72	+ 8
B. A. C. 6710	6	1.22	5.6	18 29.0	9 58.8	+11 17.4	+1.0760	0.5455	0.0558	+72	+33
e¹ Sagittarii	5½	1.20	5.1	16 33.2	11 48.2	-10 56.7	-0.9652	0.5451	0.0587	-35	-90
e² Sagittarii	5½	-1.20	+5.1	-16 23.3	12 40.9	-10 5.7	-1.0967	0.5450	+0.0602	-34	-90
β Capricorni	3	1.25	+3.6	15 8.4	2 7 35.8	+ 8 13.7	-1.0995	0.5414	0.0864	-33	-90
				NEW	*MOON.*						
67 Aquarii	6½	1.11	-2.7	7 33.6	5 8 0.9	+ 6 28.0	-0.3596	0.5276	0.1580	+13	-57
λ Aquarii	4	-1.09	-3.2	- 8 11.3	12 53.7	+11 12.3	+1.1130	0.5267	+0.1611	+82	+33
78 Aquarii	6½	1.08	3.2	7 48.7	13 55.0	-11 48.3	+0.8622	0.5267	0.1615	+83	+14
81 Aquarii	6½	1.06	3.6	7 40.5	17 28.7	- 8 20.9	+1.2885	0.5264	0.1637	+83	+54
82 Aquarii	6½	1.05	3.6	7 11.3	18 4 9	- 7 45.7	+0.8488	0.5264	0.1637	+83	+13
φ Aquarii	4	1.01	4.1	6 39.9	6 0 14.2	- 1 47.1	+1.2868	0.5259	0.1665	+84	+53
96 Aquarii	5½	-0.99	-4.2	- 5 45.0	2 53.0	+ 0 47.0	+0.7203	0.5258	+0.1681	+84	+ 5
B. A. C. 8184	6	0.95	4.5	5 9.4	8 11.1	+ 5 55.9	+0.9618	0.5258	0.1698	+85	+21
20 Piscium	5½	0.87	5.1	- 3 23.8	17 48.8	- 8 43.3	+0.6738	0.5259	0.1728	+84	+ 3
44 Piscium	6	0 69	5.5	+ 1 18.4	7 13 18.4	+10 12.0	-1.0775	0.5271	0.1753	-30	-89
10 Ceti	6	0.70	6.0	- 0 40.9	13 56.2	+10 48.6	+1.2045	0.5272	0.1753	+90	+42
B. A. C. 237	6½	-0.56	-6.1	+ 2 45.9	8 2 38.4	- 0 51.6	-0.3296	0.5298	+0.1744	+16	-55
77 Piscium	6	0.48	6.2	4 18.0	10 2.3	+ 6 19.0	-0.7079	0.5315	0.1730	- 5	-86
96 Piscium	6½	0.36	6.4	6 42.2	21 45.0	- 6 19.6	-1.2957	0.5351	0.1692	-55	-84
μ Piscium	5	0.37	6.7	5 33.2	22 18.5	- 5 47.1	+0.0395	0.5352	0.1692	+37	-31
64 Ceti	5½	0.14	7.5	8 2.1	9 18 36.4	-10 7.0	+0.7063	0.5436	0.1584	+90	+ 7
ξ¹ Ceti	4	-0.12	-7.4	+ 8 18.6	19 23.6	- 9 21.4	+0.5371	0.5438	+0.1578	+71	- 3
ξ Arietis	5	0.06	7.2	10 5.5	10 1 3.7	- 3 52.0	-0.4769	0.5464	0.1539	+ 8	-61
B. A. C. 755	6½	-0.06	7.3	10 3.0	1 59.6	- 2 57.8	-0.2907	0.5470	0.1531	+18	-48
85 Ceti	6	+0.03	7.8	10 15.2	9 27.5	+ 4 15.6	+0.6144	0.5512	0.1468	+78	+ 3
38 Arietis	5	0.05	7.2	11 57.9	10 35.6	+ 5 21.4	-1.0304	0.5517	0.1459	-27	-78
Lalande 5725	6	+0.17	-7.6	+12 45.0	20 33.4	- 9 0.1	-0.4474	0.5575	+0.1361	+10	-57
f Tauri	4	0.30	8 4	12 32.6	11 7 42.4	+ 1 45.8	+1.2148	0.5641	0.1236	+90	+52
48 Tauri	6	0.55	8.8	15 6.9	12 3 24.5	- 3 13.6	+0.7091	0.5767	0.0962	+90	+18
γ Tauri	4	0.57	8.8	15 21.1	5 7.9	- 1 33.9	+0.6277	0.5776	0.0941	+81	+10
58 Tauri	6	0.57	9.1	14 49.2	5 29.3	- 1 13.3	+1.2103	0.5781	0.0930	+90	+53
δ¹ Tauri	4	+0.60	-8.4	+17 16.4	6 26.4	- 0 18.3	-1.2337	0.5788	+0.0916	-51	-73
63 Tauri	6	0.59	8.7	16 30.5	6 39.7	- 0 5.5	-0.4243	0.5789	0.0914	+11	-50
δ² Tauri	5½	0.61	8.4	17 10.7	6 56.4	+ 0 10.7	-1.0889	0.5789	0.0910	-34	-73
70 Tauri	6	0.60	8.9	15 40.7	7 37.0	+ 0 49.8	+0.5186	0.5794	0.0898	+70	+ 5
71 Tauri	6	0.61	9.1	15 21.5	7 56.0	+ 1 8.0	+0.8772	0.5794	0.0894	+90	+26
75 Tauri	6	+0.64	-7.9	+16 6.2	8 48.9	+ 1 59.1	+0.1871	0.5799	+0.0880	+46	-13
θ¹ Tauri	4	0.62	9.0	15 42.5	8 52.5	+ 2 2.5	+0.5988	0.5799	0.0880	+78	+ 9
θ² Tauri	4	0.62	9.0	15 37.0	8 54.9	+ 2 4.8	+0.6964	0.5799	0.0880	+90	+15
80 Tauri	6	0.62	9.1	15 23.2	9 33.0	+ 2 41.5	+0.9879	0.5807	0.0866	+90	+34
B. A. C. 1391	5	0.63	8.9	15 56.7	9 42.9	+ 2 51.1	+0.4286	0.5807	0.0866	+63	0
81 Tauri	6	+0.62	-9.1	+15 26.6	9 45.7	+ 2 53.7	+0.9482	0.5807	+0.0864	+90	+32
85 Tauri	6½	0.64	9.2	15 36.3	10 16.5	+ 3 23.4	+0.8262	0.5808	0.0861	+90	+23
α Tauri	1	0.66	8.9	16 16.7	11 58.9	+ 5 2.1	+0.2775	0.5822	0.0831	+51	- 8
σ¹ Tauri	5	0.66	9.3	15 34.4	13 21.7	+ 6 21.8	+1.1133	0.5825	0.0811	+90	+45
σ² Tauri	5	0.66	9.2	15 41.4	13 24.3	+ 6 24.3	+0.9970	0.5830	0.0802	+90	+36
B. A. C. 1526	5	+0.76	-9.2	+16 58.4	20 57.2	-10 19.5	+0.2400	0.5875	+0.0676	+49	- 9
m Tauri	5	+0.83	-9.0	+18 29.4	13 1 3.3	- 6 22.6	+1.0464	0.5902	+0.0603	-30	-72

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
111 Tauri	5½	+0.89	-10.9	+17 16.4	13 8 2.2	+ 0 20.4	+0.5667	0.5943	+0.0483	+75	+11
115 Tauri	6	0.90	9.8	17 51.7	9 9.0	+ 1 24.6	+0.0203	0.5950	0.0452	+36	-18
117 Tauri	6	0.89	10.1	17 8.8	9 30.7	+ 1 45.5	+0.7674	0.5956	0.0438	+90	+24
119 Tauri	5	0.92	9.7	18 30.3	11 10.8	+ 3 21.8	-0.5438	0.5961	0.0412	+ 4	-55
B. A. C. 1728	6	0.91	10.3	16 58.1	11 13.3	+ 3 24.2	+1.0148	0.5961	0.0412	+90	+41
120 Tauri	6	+0.93	- 9.7	+18 27.3	11 42.7	+ 3 52.4	-0.4728	0.5967	+0.0397	+ 8	-49
122 Tauri	6	0.93	10.4	16 57.9	13 9.8	+ 5 16.1	+1.0922	0.5967	0.0373	+90	+48
127 Tauri	6	0.96	9.7	18 55.2	15 28.3	+ 7 29.3	-0.8047	0.5983	0.0322	-13	-71
130 Tauri	6	0.98	10.2	17 41.0	17 19.1	+ 9 15.8	+0.5011	0.5988	0.0291	+69	+ 9
71 Orionis	6	1.09	10.5	19 11.4	14 4 10.4	- 4 18.6	-0.8237	0.6036	+0.0065	-14	-71
26 Geminorum	5½	+1.18	-11.4	+17 45.2	14 59.4	+ 6 4.6	+0.5582	0.6074	-0.0166	+74	+14
λ Geminorum	4	1.28	12.1	16 44.6	15 4 50.9	- 4 37.4	+1.1156	0.6108	0.0465	+90	+49
W. vii., 685	6	1.33	12.2	17 19.6	10 7.6	+ 0 26.5	+0.2617	0.6110	0.0576	+51	- 6
f Geminorum	6	1.34	12.1	17 55.9	13 4.6	+ 3 16.4	-0.5147	0.6113	0.0638	+ 5	-54
1 Cancri	6	1.38	12.7	16 5.5	19 51.6	+ 9 46.9	+0.8155	0.6115	0.0781	+90	+24
3 Cancri	6	+1.39	-12.4	+17 37.0	21 18.1	+11 9.8	-0.8002	0.6115	-0.0807	-12	-73
5 Cancri	6	1.39	12.5	16 46.0	21 35.3	+11 26.4	+0.0148	0.6115	0.0818	+35	-22
29 Cancri	6	1.43	13.1	14 35.1	16 8 6.2	- 2 28.3	+1.1874	0.6106	0.1022	+90	+51
54 Cancri	6	1.46	13.0	15 46.2	16 47.4	+ 5 51.9	-0.9337	0.6088	0.1184	-21	-75
ξ Leonis	5	1.48	13.2	11 48.1	17 8 53.6	- 2 40.3	+0.8283	0.6045	0.1443	+90	+18
18 Leonis	6	+1.48	-13.0	+12 20.0	14 36.9	+ 2 49.6	-0.5414	0.6026	-0.1525	+ 4	-64
A Leonis	4½	1.48	12.9	10 33.2	23 15.1	+11 7.5	-0.1632	0.5993	0.1631	+25	-40
44 Leonis	6	1.47	12.6	9 21.6	18 6 16.4	- 6 7.5	-0.1667	0.5965	0.1706	+25	-41
ρ Leonis	4	1.46	12.5	9 53.4	9 21.0	- 3 9.9	-1.2148	0.5953	0.1735	-44	-80
48 Leonis	5½	1.48	12.3	7 32.3	10 10.9	- 2 22.0	+0.9469	0.5947	0.1744	+90	+23
49 Leonis	6	+1.47	-12.4	+ 9 14.2	10 15.9	- 2 17.2	-0.7343	0.5947	-0.1744	- 6	-80
37 Sextantis	6	1.47	12.1	6 58.2	14 48.6	+ 2 5.2	+0.6893	0.5926	0.1783	+87	+ 6
56 Leonis	6½	1.46	11.8	6 47.5	18 54.4	+ 6 1.7	+0.1278	0.5909	0.1813	+42	-26
c Leonis	5	1.45	11.8	6 42.7	20 51.8	+ 7 54.7	-0.1493	0.5901	0.1826	+26	-42
τ Leonis	5	1.42	10.7	3 28.9	19 8 14.3	- 5 8.2	+0.9260	0.5855	0.1884	+90	+19
89 Leonis	6	+1.42	-10.6	+ 3 41.4	10 57.7	- 2 30.9	+0.2062	0.5841	-0.1893	+47	-23
13 Virginis	6	1.36	8.4	- 0 9.3	20 5 55.2	- 8 14.5	+0.4130	0.5767	0.1914	+60	-12
η Virginis	4	1.33	8.4	0 2.1	6 27.6	- 7 43.2	+0.1883	0.5763	0.1912	+46	-24
JUPITER				0 21.8	8 28.9	- 5 46.3	+0.1318	0.5791	0.1894	+43	-28
URANUS				2 5.5	12 2.2	- 2 20.5	+1.1850	0.5754	0.1909	+88	+38
γ Virginis	3	+1.29	- 7.3	- 0 49.6	15 58.1	+ 1 27.1	-0.8308	0.5729	-0.1892	-13	-90
38 Virginis	6	1.26	6.7	2 56.1	21 0.5	+ 6 18.8	+0.3411	0.5715	0.1877	+55	-15
k Virginis	6	1.25	6.3	3 12.0	23 51.0	+ 9 3.4	+0.0758	0.5705	0.1864	+39	-30
46 Virginis	6	1.25	6.3	2 45.4	21 0 16.0	+ 9 27.4	-0.4497	0.5705	0.1864	+10	-63
48 Virginis	6½	1.24	6.1	3 3.1	1 43.7	+10 52.0	-0.4230	0.5698	0.1856	+11	-61
θ Virginis	4½	+1.23	- 5.4	- 4 55.9	4 23.7	-10 33.5	+0.9877	0.5690	-0.1841	+85	+23
65 Virginis	6	1.18	5.1	4 19.8	10 20.7	- 4 48.9	-0.7084	0.5672	0.1810	- 6	-90
66 Virginis	6	1.17	4.9	4 34.2	10 53.2	- 4 17.5	-0.5613	0.5672	0.1804	+ 3	-72
l^1 Virginis	6½	1.16	4.3	5 52.9	13 30.4	- 1 45.7	+0.3025	0.5664	0.1786	+52	-18
l^2 Virginis	5	1.15	4.3	5 40.2	14 12.3	- 1 5.3	-0.0374	0.5664	0.1784	+31	-37
80 Virginis	6	+1.14	- 4.4	- 4 49.0	15 47.8	+ 0 26.9	-1.1929	0.5658	-0.1771	-42	-90
88 Virginis	6½	1.10	3.6	6 16.2	21 31 5	+ 5 58.8	-0.7126	0.5645	0.1728	- 7	-90
B A.C.4647 *mult.*	6½	1.08	3.0	7 30.0	22 0 31.6	+ 8 52.8	+0.0325	0.5637	0.1702	+34	-33
94 Virginis	6½	1.04	2.2	8 20.9	5 37.5	-10 11.7	+0.0498	0.5625	0.1658	+35	-32
95 Virginis	6	1.04	2.0	8 46.2	5 49.1	-10 0.5	+0.4520	0.5625	0.1657	+60	-10
κ Virginis	4	+1.02	- 1.5	- 9 44.6	8 35.9	- 7 19.3	+1.0002	0.5620	-0.1630	+81	+24
ξ^1 Libræ	6	0.85	+ 0.7	11 26.0	23 3 29.0	+10 55.4	-0.1344	0.5590	0.1429	+22	-42
ξ^2 Libræ	5½	0.84	0.7	10 57.0	4 34.8	+11 59.0	-0.7962	0.5589	0.1416	-15	-90
γ Libræ	4½	0.66	3.2	14 24.4	22 20.5	+ 5 9.0	+0.5229	0.5567	0.1196	+61	- 5
η Libræ	6	0.63	3.7	15 18.4	24 2 16.6	+ 8 57.3	+1.0202	0.5562	0.1140	+75	+27
48 Libræ	5½	+0.53	+ 3.7	-13 56.9	8 49.7	- 8 42.6	-1.1416	0.5556	-0.1047	-45	-90
49 Libræ	6	+0.54	+ 4.5	-16 11.8	9 48.7	- 7 45.5	+1.1442	0.5555	-0.1032	+74	+39

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0. Δα	Red'ns from 1886.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
φ Ophiuchi	4½	+0.38	+ 5.4	-16 21.8	25 0 4.6	+ 6 2.0	+0.0126	0.5542	-0.0825	+24	-34
24 Scorpii	5½	+0.32	6.0	17 31.2	4 54.6	+10 42.3	+0.8814	0.5540	-0.0750	+73	+17
B. A. C. 6294	5½	-0.29	7.0	18 28.7	27 8 38.1	-11 15.4	+0.1524	0.5484	+0.0068	+25	-26
ρ¹ Sagittarii	4	0.56	6.3	18 3.6	28 8 47.7	-11 52.2	+0.3047	0.5450	0.0440	+38	-17
ρ² Sagittarii	6½	0.56	6.4	18 31.1	8 51.8	-11 48.2	+0.8164	0.5450	0.0440	+72	+13
B. A. C. 6710	6	-0.62	+ 5.9	-18 29.0	16 15.7	- 4 38.3	+1.1460	0.5437	+0.0547	+72	+41
e¹ Sagittarii	5½	0.63	5.3	16 33.2	18 5.3	- 2 52.2	-0.8933	0.5433	0.0575	-30	-90
e² Sagittarii	5½	-0.63	+ 5.1	-16 23.3	18 58.1	- 2 1.0	-1.0264	0.5433	+0.0588	-40	-90

MARCH.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
g Sagittarii	5	-0.68	+ 4.8	-15 47.5	1 2 32.2	+ 5 18.9	-1.2012	0.5417	+0.0698	-56	-90
β Capricorni	3	0.77	3.8	15 8.4	13 55.3	- 7 39.3	-1.0445	0.5398	0.0850	-38	-90
B. A. C. 7063	6½	0.80	3.6	15 26.1	18 56.8	- 2 47.0	-0.2724	0.5390	0.0917	+10	-51
τ¹ Capricorni	6½	0.83	3.4	15 32.4	22 2.0	+ 0 12.5	+0.1334	0.5384	0.0956	+33	-27
τ² Capricorni	5½	-0.84	+ 3.2	-15 21.2	22 59.9	+ 1 8.5	+0.0185	0.5384	+0.0967	+26	-34
Lalande 40522	6	0.89	2.6	14 55.4	2 8 44.3	+10 35.0	+0.5428	0.5366	0.1087	+62	- 4
8 Aquarii	6½	0.89	2.2	13 29.7	9 22.0	+11 11.6	0.9763	0.5364	0.1096	-30	-90
9 Aquarii	6½	0.89	2.3	13 58.6	9 58.4	+11 46.9	-0.3742	0.5363	0.1100	+ 6	-58
18 Aquarii	5½	0.94	1.3	13 22.0	21 37.2	- 0 55.5	+0.3073	0.5344	0.1232	+46	-17
λ Capricorni	5½	-0.97	+ 0.2	-11 53.5	3 9 0.9	+10 7.6	+0.1387	0.5326	+0.1346	+38	-27
				NEW	*MOON.*						
Mercury				- 2 30.7	6 0 44.1	- 0 2.2	-0.1520	0.4522	0.1322	+23	-41
44 Piscium	6	0.83	- 6.3	+ 1 18.4	19 6.3	- 6 12.6	-1.1048	0.5307	0.1761	-32	-59
10 Ceti	6	-0.84	- 6.5	- 0 40.9	19 43.8	- 5 36.3	+1.1735	0.5308	+0.1760	+90	+39
B. A. C. 237	6½	0.76	7.1	+ 2 45.9	7 8 20.1	+ 6 37.4	-0.3619	0.5328	0.1752	+14	-56
77 Piscium	6	0.72	7.3	4 18.0	15 40.9	-10 15.1	-0.7437	0.5346	0.1737	- 7	-83
μ Piscium	5	0.66	8.0	5 33.2	8 3 53.2	+ 1 35.0	-0.0004	0.5379	0.1697	+34	-34
64 Ceti	5½	0.51	8.6	8 2.1	9 0 8.9	- 2 47.1	+0.6659	0.5447	0.1589	+84	+ 5
ξ¹ Ceti	4	-0.49	- 8.6	+ 8 18.6	0 56.2	- 2 1.3	+0.4976	0.5447	+0.1580	+67	- 5
ξ Arietis	5	0.44	8.6	10 5.5	6 36.9	+ 3 28.5	-0.5213	0.5471	0.1537	+ 6	-65
B. A. C. 755	6½	0.45	8.6	10 3.0	7 32.8	+ 4 22.7	-0.3327	0.5475	0.1530	+16	-51
85 Ceti	6	0.38	9.0	10 15.2	15 2.8	+11 38.2	+0.5748	0.5504	0.1469	+74	+ 1
38 Arietis	5	0.35	8.7	11 57.9	16 11.2	-11 15.6	-1.0799	0.5509	0.1460	-36	-78
Lalande 5725	6	-0.27	- 8.9	+12 45.0	10 2 14.0	- 1 32.5	-0.4927	0.5556	+0.1361	+ 7	-60
f Tauri	4	-0.17	9.5	12 32.5	13 30.1	+ 9 21.0	+1.1841	0.5613	0.1228	+90	+48
48 Tauri	6	+0.06	9.6	15 6.8	11 9 32.6	+ 4 42.0	+0.6773	0.5712	0.0956	+88	+13
γ Tauri	4	0.08	9.6	15 21.0	11 18.3	+ 6 24.0	+0.5984	0.5719	0.0934	+78	+ 9
58 Tauri	6	0.06	9.9	14 49.1	11 40.2	+ 6 45.2	+1.1860	0.5725	0.0923	+90	+52
63 Tauri	6	+0.08	- 9.4	+16 30.4	12 52.2	+ 7 54.6	-0.4659	0.5728	+0.0907	+ 8	-53
δ³ Tauri	5½	0.10	9.1	17 10.6	13 9.2	+ 8 11.0	-1.1382	0.5728	0.0904	-39	-73
70 Tauri	6	0.09	9.6	15 40.6	13 50.8	+ 8 51.1	+0.4864	0.5732	0.0891	+67	+ 3
71 Tauri	6	0.10	9.8	15 21.4	14 10.1	+ 9 9.7	+0.8494	0.5733	0.0889	+90	+24
75 Tauri	6	0.13	8.6	16 6.2	15 4.3	+10 2.0	+0.1510	0.5736	0.0875	+46	-15
θ¹ Tauri	4	+0.11	- 9.7	+15 42.4	15 8.0	+10 5.5	+0.5693	0.5736	+0.0873	+75	+ 7
θ² Tauri	4	0.11	9.7	15 36.9	15 10.4	+10 7.8	+0.6681	0.5736	0.0873	+87	+13
80 Tauri	6	0.11	9.8	15 23.1	15 49.4	+10 45.5	+0.9629	0.5740	0 0861	+90	+33
B. A. C. 1391	5	0.12	9.6	15 56.5	15 59.5	+10 55.3	+0.3957	0.5742	0.0859	+60	- 2
81 Tauri	6	0.11	9.8	15 26.5	16 2.4	+10 58.1	+0.9232	0.5742	0.0859	+90	+30
85 Tauri	6½	+0.13	- 9.8	+15 36.2	16 33.8	+11 28.3	+0.7980	0.5746	+0.0847	+90	+21
α Tauri	1	0.16	9.6	16 16.6	18 18.8	-10 50.5	+0.2444	0.5750	0.0825	+50	-10
σ¹ Tauri	5	0.15	9.9	15 34.3	19 43.5	- 9 28.7	+1.0912	0.5760	0.0797	+90	+43
σ² Tauri	5	0.15	9.8	15 41.3	19 46.3	- 9 26.1	+0.9734	0.5760	0.0797	+90	+34
B. A. C. 1526	5	0.25	9.8	16 58.3	12 3 30.8	- 1 58.4	+0.2088	0.5799	0.0666	+47	-10
m Tauri	5	+0.32	- 9.5	+18 29.3	7 43.9	+ 2 5.5	-1.0952	0.5818	+0.0594	-35	-72
111 Tauri	5½	+0.38	-10.2	+17 16.4	14 55.4	+ 9 1.1	+0.5423	0.5851	+0.0465	+73	+10

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0. Δα	Red'ns from 1886.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
113 Tauri	6½	+0.38	-10.4	+16 35.7	12 15 38.9	+ 9 43.0	+1.2715	0.5854	+0.0450	+90	+70
115 Tauri	6	0.39	10.0	17 51.7	16 4.3	+10 7.5	-0.0137	0.5854	0.0444	+34	-20
117 Tauri	6	0.39	10.2	17 8.5	16 26.6	+10 28.9	+0.7442	0.5860	0.0434	+90	+22
119 Tauri	5	0.42	9.9	18 30.3	18 10.0	-11 51.5	-0.5860	0.5861	0.0406	+ 1	-58
B. A. C. 1728	6	0.41	10.5	16 58.1	18 12.6	-11 49.0	+0.9954	0.5861	0.0406	+90	+40
120 Tauri	6	+0.42	- 9.9	+18 27.3	18 42.9	-11 19.9	-0.5105	0.5866	+0.0392	+ 5	-52
122 Tauri	6	0.43	10.5	16 57.9	20 12.8	- 9 53.3	+1.0767	0.5871	0.0368	+90	+46
127 Tauri	6	0.47	9.8	18 55.2	22 35.8	- 7 35.6	-0.8498	0.5883	0.0320	-16	-71
130 Tauri	6	0.49	10.3	17 41.0	13 0 30.1	- 5 45.6	+0.4766	0.5889	0.0282	+67	+ 8
71 Orionis	6	0.62	10.3	19 11.4	11 44.1	+ 5 2.9	-0.8650	0.5929	+0.0063	-17	-71
26 Geminorum	5½	+0.74	-11.2	+17 45.2	22 56.9	- 8 10.1	+0.5409	0.5961	-0.0161	+73	+13
λ Geminorum	4	0.90	11.7	16 44.6	14 13 19.9	+ 5 39.4	+1.1166	0.5987	0.0448	+90	+49
W. vii. 685	6	0.96	11.6	17 19.6	18 48.6	+10 55.3	+0.2462	0.5994	0.0565	+50	- 7
f Geminorum	6	0.99	11.4	17 55.9	21 52.2	-10 8.2	-0.5423	0.5997	0.0626	+ 4	-56
1 Cancri	6	1.06	12.1	16 5.5	15 4 54.6	- 3 22.2	+0.8126	0.5999	0.0763	+90	+24
3 Cancri	6	+1.08	-11.6	+17 37.0	6 24.1	- 1 56.2	-0.8307	0.6001	-0.0796	-14	-73
5 Cancri	6	1.08	11.9	16 46.0	6 42.1	- 1 38.9	-0.0033	0.5999	0.0799	+34	-23
29 Cancri	6	1.19	12.7	14 35.1	17 35.5	+ 8 49.0	+1.1912	0.5995	0.1003	+90	+52
54 Cancri	6	1.27	12.3	15 46.2	16 2 33.9	- 6 33.5	-0.9576	0.5984	0.1161	-22	-75
ξ Leonis	5	1.39	13.1	11 48.1	19 9.4	+ 9 23.6	+0.8322	0·5961	0.1420	+90	+18
18 Leonis	6	+1.42	-12.8	+12 20.0	17 1 1.7	- 8 57.6	-0.5542	0.5950	-0.1503	+ 4	-66
A Leonis	4½	1.47	12.9	10 33.2	9 51.5	- 0 27.9	-0.1698	0.5927	0.1612	+25	-41
44 Leonis	6	1.51	12.8	9 21.6	17 1.1	+ 6 25.4	-0.1730	0.5910	0.1689	+25	-42
ρ Leonis	4	1.52	12.5	9 53.4	20 8.7	+ 9 26.1	-1.2294	0.5902	0.1719	-46	-80
48 Leonis	5½	1.52	12.8	7 32.3	20 59.5	+10 14.9	+0.9508	0.5899	0.1729	+90	+23
49 Leonis	6	+1.53	-12.6	+ 9 14.2	21 4.5	+10 19.7	-0.7432	0.5899	-0.1729	- 7	-79
37 Sextantis	6	1.56	12.7	6 58.2	18 1 41.2	- 9 14.0	+0.6905	0.5887	0.1770	+88	+ 6
56 Leonis	6½	1.58	12.5	6 47.5	5 50.1	- 5 14.3	+0.1253	0.5878	0.1802	+42	-26
c Leonis	5	1.57	12.3	6 42.7	7 48.8	- 3 20.1	-0.1534	0.5874	0.1816	+26	-42
τ Leonis	5	1.62	12.0	3 28.9	19 16.4	+ 7 42.2	+0.9251	0.5844	0.1880	+90	+19
89 Leonis	6	+1.63	-11.8	+ 3 41.4	22 0.5	+10 20.3	+0.2050	0.5837	-0.1892	+47	-23
JUPITER				+ 0 56.8	19 14 30.7	+ 2 14.5	-0.2227	0.5849	0.1901	+22	-48
13 Virginis	6	1.67	10.3	- 0 9.4	16 56.3	+ 4 34.8	+0.4091	0.5792	0.1922	+69	-12
η Virginis	4	1.66	10.3	0 2.2	17 28.6	+ 5 6.0	+0.1879	0.5790	0.1923	+46	-24
URANUS				1 40.0	21 18.7	+ 8 47.8	+1.0780	0.5804	0.1927	+88	+29
γ Virginis	3	+1.66	- 9.4	- 0 49.7	20 2 54.2	- 9 48.6	-0.8293	0.5769	-0.1907	-12	-90
38 Virginis	6	1.66	8.9	2 56.1	7 53.1	- 5 0.4	+0.3379	0 5760	0.1892	+55	-16
k Virginis	6	1.65	8.5	3 12.0	10 41.4	- 2 18.0	+0.0720	0.5753	0.1880	+38	-31
46 Virginis	6	1.65	8.5	2 45.4	11 6.0	- 1 54.3	-0.4505	0.5750	0.1879	+10	-63
48 Virginis	6½	1.65	8.3	3 3.1	12 32.5	- 0 30.9	-0.4239	0.5748	0.1872	+11	-61
θ Virginis	4½	+1.66	- 7.9	- 4 55.9	15 10.1	+ 2 1.1	+0.9770	0.5748	-0.1862	+85	+22
65 Virginis	6	1.64	7.5	4 19.8	21 1.1	+ 7 39.8	-0.7087	0.5736	0.1830	- 6	-90
66 Virginis	6	1.64	7.4	4 34.2	21 32.9	+ 8 10.5	-0.5641	0.5735	0.1826	+ 3	-73
l^1 Virginis	6½	1.65	7.0	5 52.9	21 0 7.5	+10 39.6	+0.2951	0.5729	0.1811	+51	-18
l^2 Virginis	5	1.65	6.9	5 40.2	0 48.5	+11 19.1	-0.0422	0.5727	0.1805	+31	-37
80 Virginis	6	+1.63	- 6.9	- 4 49.0	2 22.3	-11 10.4	-1.1885	0.5727	-0.1796	-42	-90
88 Virginis	6½	1.63	6.1	6 16.2	7 59.0	- 5 45.5	-0.7114	0.5717	0.1753	- 7	-90
B.A C.4647 *mult.*	6½	1.63	5.5	7 30.0	10 55.2	- 2 55.5	+0.0255	0.5712	0.1729	+34	-33
94 Virginis	6½	1.62	4.8	8 21.0	15 54.2	+ 1 53.1	+0.0425	0.5712	0.1685	+35	-32
95 Virginis	6	1.62	4.7	8 46.3	16 5.5	+ 2 4.0	+0.4425	0.5707	0.1683	+60	-10
κ Virginis	4	+1.62	- 4.3	- 9 44.7	18 48.3	+ 4 41.1	+0.9854	0.5702	-0.1657	+81	+22
ξ^1 Libræ	6	1.52	2.0	11 26.0	22 13 12.6	- 1 32.9	-0.1449	0.5679	0.1457	+22	-43
ξ^2 Libræ	5½	1.51	1.8	10 57.0	14 16.6	- 0 31.1	-0.7989	0.5678	0.1444	-15	-90
18 Libræ	6	1.50	- 1.8	10 41.2	15 14.1	+ 0 24.3	-1.2106	0.5675	0.1431	-49	-90
γ Libræ	4½	1.41	+ 0.5	14 24.5	23 7 32.9	- 7 50.6	+0.5025	0.5656	0.1212	+59	- 6
η Libræ	6	+1.38	+ 1.3	-15 18.5	11 22.5	- 4 8.9	+0.9938	0.5652	-0.1163	+75	+25
48 Libræ	5½	+1.30	+ 1.5	-13 57.0	17 44.8	+ 2 0.4	-1.1437	0.5643	-0.1064	-46	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
49 Libræ	6	+1.32	+ 2.2	-16 11.8	23 18 42.2	+ 2 55.7	+1.1128	0.5640	-0.1050	+74	+36
ϕ Ophiuchi	4½	1.16	3.6	16 21.8	24 8 35.4	- 7 39.4	-0.0071	0.5622	0.0835	+23	-35
24 Scorpii	5½	1.13	4.2	17 31.2	13 18.1	- 3 6.4	+0.8482	0.5614	-0.0765	+73	+15
B. A. C. 6294	5½	0.51	7.1	18 28.7	26 16 1.3	- 2 4.6	+0.1222	0.5516	+0.0064	+23	-28
ρ^1 Sagittarii	4	0.22	7.2	18 3.6	27 15 56.2	- 2 56.0	+0.2718	0.5459	0.0439	+36	-19
ρ^2 Sagittarii	6½	+0.22	+ 7.3	-18 31.1	16 0.2	- 2 52.1	+0.7787	0.5459	+0.0439	+72	+11
B. A. C. 6710	6	0.14	7.1	18 29.0	23 21.2	+ 4 14.9	+1.1074	0 5441	0.0546	+72	+36
e^1 Sagittarii	5½	0.12	6.4	16 33.2	28 1 10.3	+ 6 0.4	-0.9204	0.5436	0.0574	-32	-90
e^2 Sagittarii	5½	+0.11	6.4	16 23.3	2 2.8	+ 6 51.3	-1.0532	0.5436	0.0587	-42	-90
β Capricorni	3	-0.10	5.5	15 8.4	20 56.3	+ 1 9.3	-1.0745	0.5390	0.0851	-41	-90
B. A. C. 7063	6½	-0.16	+ 5.3	-15 26.1	29 1 57.4	+ 6 1.2	-0.3029	0.5379	+0.0914	+ 8	-53
τ^1 Capricorni	6½	0.19	5.3	15 32.4	5 2.5	+ 9 0.5	+0.1016	0.5372	0.0955	+31	-29
τ^2 Capricorni	5½	0.20	5.2	15 21.2	6 0.3	+ 9 56.5	-0.0129	0.5370	0.0967	+25	-35
Lalande 40522	6	0.30	4.7	14 55.3	15 44.7	- 4 37.0	+0.5082	0.5348	0.1086	+59	- 6
8 Aquarii	6½	0.29	4.3	13 29.6	16 22.4	- 4 0.4	-1.0053	0.5347	0.1096	-32	-90
9 Aquarii	6½	-0·30	+ 4.4	-13 58.5	16 58.8	- 3 25.2	-0.4047	0.5347	+0.1100	+ 5	-60
18 Aquarii	5½	0.40	3.6	13 21.9	30 4 38.1	+ 7 52.9	+0.2770	0.5327	0.1230	+45	-19
λ Capricorni	5½	0.47	2.5	11 53.5	16 2.6	- 5 3.1	+0.1144	0.5310	0.1343	+36	-28
B. A. C. 7620	6½	0.49	1.9	10 50.9	19 40.6	- 1 31.6	-0.5459	0.5305	0.1380	0	-72
B. A. C. 7774	6½	0.57	+ 0.8	9 36.5	31 7 38.7	+10 5.1	-0.2023	0.5286	0.1480	+20	-47
67 Aquarii	6½	-0.64	- 0.7	- 7 33.6	21 15.7	- 0 42.2	-0.3727	0.5288	+0.1581	+12	-58
					APRIL.						
λ Aquarii	4	-0.67	- 0.9	- 8 11.2	1 2 6.3	+ 3 59.9	+1.0914	0.5288	+0.1612	+82	+31
78 Aquarii	6½	-0.68	- 1.0	- 7 48.6	3 7.1	+ 4 59.0	+0.8418	0.5285	+0.1619	+83	+13
81 Aquarii	6½	0.69	1.3	7 40.4	6 39.0	+ 8 24.5	+1.2642	0.5286	0.1642	+83	+50
82 Aquarii	6½	0.69	1.4	7 11.2	7 14.9	+ 8 59.5	+0.8260	0.5286	0.1643	+83	+12
ϕ Aquarii	4	0.72	2.0	6 39.8	13 20.4	- 9 5.9	+1.2639	0.5287	0.1674	+84	+50
96 Aquarii	5½	0.72	2.4	5 44.9	15 57.5	- 6 33.4	+0.6980	0.5289	0.1687	+84	+ 4
B. A. C. 8184	6	-0.73	- 2.9	- 5 9.3	21 11.9	- 1 28.3	+0.9363	0.5293	+0.1710	+85	+19
20 Piscium	5½	0.75	3.8	- 3 23.8	2 6 41.7	+ 7 44.5	+0.6533	0.5300	0.1743	+81	+ 2
				NEW	*MOON.*						
64 Ceti	5½	0.68	8.8	+ 8 2.1	5 6 16.8	+ 5 8.3	+0.7154	0.5492	0.1608	+90	+ 8
ξ^1 Ceti	4	-0.67	- 8.8	+ 8 18.6	7 3.4	+ 5 53.4	+0.5466	0.5495	+0.1603	+71	- 2
ξ Arietis	5	0.64	9.0	10 5.5	12 39.3	+11 18.4	-0.4641	0.5521	0.1559	+ 9	-60
B. A. C. 755	6½	0.65	9.0	10 3.0	13 34.5	-11 48.1	-0.2745	0.5523	0.1551	+19	-48
85 Ceti	6	0.62	9.4	10 15.1	20 58.4	- 4 38.7	+0.6339	0.5554	0.1489	+81	+ 4
38 Arietis	5	0.60	9.2	11 57.8	22 5.9	- 3 33.4	-1.0095	0.5559	0.1479	-25	-78
Lalande 5725	6	-0.56	- 9.5	+12 44.9	6 8 0.9	+ 6 1.8	-0.4220	0.5600	+0.1377	+11	-55
f Tauri	4	0.50	10.0	12 32.5	19 9.4	- 7 12.4	+1.2575	0.5649	0.1247	+90	+58
18 Tauri	6	0.33	10.1	15 6.8	7 15 1.7	+11 58.4	+0.7636	0.5738	0.0969	+90	+18
γ Tauri	4	0.33	10.2	15 21.0	16 46.7	-10 20.3	+0.6831	0.5746	0.0940	+89	+14
58 Tauri	6	0.34	10.4	14 49.1	17 8.5	- 9 59.2	+1.2726	0.5747	0.0937	+90	+65
δ^1 Tauri	4	-0·32	- 9.7	+17 16.3	18 6.6	- 9 3.3	-1.1954	0.5752	+0.0921	-45	-73
63 Tauri	6	0.32	10.0	16 30.4	18 20.1	- 8 50.2	-0.3770	0.5752	0.0919	+13	-47
δ^2 Tauri	5½	0.31	9.8	17 10.6	18 36.9	- 8 34.0	-1.0510	0.5754	0.0910	-30	-73
70 Tauri	6	0.31	10.2	15 40.6	19 18.4	- 7 54.0	+0.5749	0.5756	0.0906	+76	+ 8
71 Tauri	6	0.31	10.3	15 21.4	19 37.6	- 7 35.4	+0.9376	0.5758	0.0895	+90	+30
75 Tauri	6	-0.28	- 9.3	+16 6.1	20 31.5	- 6 43.5	+0.2413	0.5762	+0.0880	+49	-11
θ^1 Tauri	4	0.30	10.3	15 42.4	20 35.1	- 6 40.1	+0.6580	0.5762	0.0880	+86	+13
θ^2 Tauri	4	0.30	10.3	15 36.9	20 37.6	- 6 37.6	+0.7568	0.5762	0.0878	+90	+19
80 Tauri	6	0.31	10.4	15 23.1	21 16.5	- 6 0.1	+1.0534	0.5762	0.0871	+90	+40
B. A. C. 1391	5	0.29	10.2	15 56.6	21 26.5	- 5 50.4	+0.4860	0.5766	0.0864	+67	+ 3
81 Tauri	6	-0.30	-10.4	+15 26.5	21 29.3	- 5 47.7	+1.0118	0.5766	+0.0864	+90	+36
85 Tauri	6½	-0.29	-10.3	+15 36.2	22 0.7	- 5 17.4	+0.8884	0.5766	+0.0859	+90	+27

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0.		Apparent Declination	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
α Tauri	1	-0.27	-10.2	+16 16.6	7 23 45.2	- 3 36.8	+0.3348	0.5774	+0.0829	+56	- 5
σ^1 Tauri	5	0.28	10.5	15 34.3	8 1 9.7	- 2 15.2	+1.1839	0.5776	0.0808	+90	+53
σ^2 Tauri	5	0.28	10.5	15 41.3	1 12.5	- 2 12.5	+1.0659	0.5778	0.0808	+90	+41
B. A. C. 1526	5	0.20	10.3	16 58.3	8 56.3	+ 5 14.5	+0.3025	0.5806	0.0674	+53	- 5
m Tauri	5	0.15	9.9	18 29.3	13 9.4	+ 9 18.4	-1.0012	0.5822	0.0601	-27	-72
111 Tauri	5½	-0.09	-10.4	+17 16.4	20 21.7	- 7 45.2	+0.6424	0.5847	+0.0472	+84	+16
115 Tauri	6	0.08	10.3	17 51.7	21 30.8	- 6 38.6	+0.0861	0.5851	0.0444	+40	-15
117 Tauri	6	0.08	10.5	17 8.5	21 53.4	- 6 15.9	+0.8468	0.5851	0.0441	+90	+29
119 Tauri	5	0.06	10.1	18 30.3	23 37.1	- 4 37.0	-0.4886	0.5856	0.0406	+ 7	-50
B. A. C. 1728	6	0.06	10.6	16 58.1	23 39.7	- 4 34.4	+1.0993	0.5856	0.0404	+90	+48
120 Tauri	6	-0.05	-10.1	+18 27.3	9 0 10.2	- 4 5.1	-0.4146	0.5859	+0.0399	+11	-45
122 Tauri	6	0.04	10.6	16 57.9	1 40.5	- 2 38.2	+1.1809	0.5861	0.0368	+90	+57
127 Tauri	6	-0.02	10.0	18 55.2	4 4.5	- 0 19.6	-0.7523	0.5868	0.0325	- 9	-71
130 Tauri	6	0.00	10.5	17 41.0	5 59.6	+ 1 31.2	+0.5803	0.5871	0.0287	+77	+14
71 Orionis	6	+0.11	10.1	19 11.4	17 19.9	-11 33.9	-0.7679	0.5897	+0.0070	-10	-71
26 Geminorum	5½	+0.23	-10.8	+17 45.2	10 4 41.8	- 0 37.8	+0.6528	0.5911	-0.0160	+86	+19
λ Geminorum	4	0.42	11.1	16 44.6	19 20.9	-10 32.0	+1.2303	0.5920	0.0426	+90	+62
W. vii. 685	6	0.49	10.8	17 19.6	11 0 56.9	- 5 8.8	+0.3541	0.5920	0.0557	+55	- 3
f Geminorum	6	0.51	10.5	17 55.9	4 4.8	- 2 8.1	-0.4436	0.5918	0.0616	+ 9	-48
1 Cancri	6	0.60	11.2	16 5.5	11 17.9	+ 4 48.6	+0.9276	0.5917	0.0752	+90	+31
3 Cancri	6	+0.61	-10.6	+17 37.0	12 49.7	+ 6 16.8	-0.7364	0.5914	-0.0784	- 8	-73
5 Cancri	6	0.61	10.9	16 46.0	13 8.3	+ 6 34.8	+0.0997	0.5915	0.0787	+41	-17
54 Cancri	6	0.86	11.1	15 46.2	12 9 35.4	+ 2 15.6	-0.8760	0.5885	0.1147	-16	-75
o^1 Cancri	5½	0.88	11.0	15 45.4	12 10.0	+ 4 44.4	-1.1628	0.5882	0.1184	-41	-75
ξ Leonis	5	1.05	11.9	11 48.1	13 2 42.9	- 5 15.2	+0.9317	0.5855	0.1405	+90	+25
18 Leonis	6	+1.11	-11.6	+12 20.0	8 46.9	+ 0 35.3	-0.4790	0.5843	-0.1485	+ 8	-60
A Leonis	4½	1.20	11.7	10 33.2	17 54.6	+ 9 22.9	-0.0937	0.5824	0.1591	+29	-36
44 Leonis	6	1.27	11.8	9 21.6	14 1 18.3	- 7 29.6	-0.1037	0.5809	0.1667	+29	-38
ρ Leonis	4	1.30	11.5	9 53.4	4 32 0	- 4 22.9	-1.1787	0.5799	0.1702	-40	-80
48 Leonis	5½	1.32	12.1	7 32.3	5 24.4	- 3 32.5	+1.0316	0.5798	0.1710	+90	+29
49 Leonis	6	+1.31	-11.7	+ 9 14.2	5 29.6	- 3 27.5	-0.6871	0.5795	-0.1717	- 3	-80
37 Sextantis	6	1.36	11.9	6 58.2	10 15.3	+ 1 7.9	+0.7625	0.5790	0.1749	+90	+10
56 Leonis	6½	1.40	11.7	6 47.5	14 31.7	+ 5 15.1	+0.1873	0.5781	0.1784	+46	-23
c Leonis	5	1.41	11.6	6 42.7	16 34.1	+ 7 13.1	-0.0970	0.5777	0.1798	+29	-39
τ Leonis	5	1.53	11.5	3 28.9	15 4 21.7	- 5 24.5	+0.9838	0.5760	0.1864	+90	+23
89 Leonis	6	+1.55	-11.3	+ 3 41.4	7 10.2	- 2 42.1	+0.2494	0.5757	-0.1876	+49	-20
JUPITER				+ 2 13.5	18 47.7	+ 8 30.4	-0.4830	0.5784	0.1892	+ 9	-66
13 Virginis	6	1.70	10.5	- 0 9.4	16 2 32.7	- 8 0.7	+0.4313	0.5729	0.1915	+62	-11
η Virginis	4	1.70	10.4	0 2.2	3 5.7	- 7 28.9	+0.2064	0.5729	0.1915	+47	-23
URANUS				1 12.7	5 8.2	- 5 30.6	+0.9995	0.5745	0.1922	+89	+22
γ Virginis	3	+1.76	- 9.7	- 0 49.7	12 41.6	+ 1 46.8	-0.8310	0.5721	-0.1904	-12	-90
38 Virginis	6	1.79	9.4	2 56.2	17 45.1	+ 6 39.7	+0.3386	0.5721	0.1892	+55	-16
k Virginis	6	1.81	9.0	3 12.0	20 35.6	+ 9 24.2	+0.0674	0.5715	0.1883	+38	-31
46 Virginis	6	1 80	9.0	2 45.4	21 0.7	+ 9 48.4	-0.4586	0.5717	0.1882	+ 9	-64
48 Virginis	6½	1.81	8.9	3 3.1	22 28.2	+11 12.8	-0.4353	0.5716	0.1876	+10	-62
θ Virginis	4½	+1.85	- 8.7	- 4 55.9	17 1 7.8	-10 13.1	+0.9725	0.5715	-0.1866	+85	+22
65 Virginis	6	1.86	8.1	4 19.8	7 2.3	- 4 30.9	-0.7323	0.5712	0.1835	- 7	-90
66 Virginis	6	1.87	8.1	4 34.2	7 34.4	- 4 0.0	-0.5871	0.5712	0.1832	+ 2	-75
l^1 Virginis	6½	1.89	7.8	5 52.9	10 10.1	- 1 29.7	+0.2709	0.5712	0.1819	+50	-20
l^2 Virginis	5	1.89	7.8	5 40.2	10 51.4	- 0 49.9	-0.0678	0.5712	0.1813	+30	-39
88 Virginis	6½	+1.90	- 6.9	- 6 16.2	18 4.4	+ 6 8.0	-0.7509	0.5712	-0.1765	- 9	-90
B. A. C. 4647	6½	1.94	6.5	7 30.0	21 1.2	+ 8 58.7	-0.0119	0.5712	0.1741	+32	-35
94 Virginis	6½	1.95	5.9	8 21.0	18 2 0.8	-10 12.2	-0.0034	0.5708	0.1699	+32	-35
95 Virginis	6	1.95	5.8	8 46.3	2 12 1	-10 1.3	-0.3954	0.5708	0.1698	+57	-13
κ Virginis	4	1.97	5.5	9 44.7	4 55.0	- 7 24.1	-0.9350	0.5708	0.1672	+81	+19
ξ^1 Libræ	6	+1.97	- 3.2	-11 26.1	23 15.0	+10 17.6	-0.2152	0.5708	-0.1477	+18	-48
ξ^2 Libræ	5½	+1.95	- 3.0	-10 57.1	19 0 18.5	+11 18.9	-0.8714	0.5707	-0.1464	-20	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
γ Libræ	4½	+1.95	- 0.7	-14 24.5	19 17 24.2	+ 3 48.8	+0.4031	0.5700	-0.1232	+52	-12
η Libræ	6	1.94	0.0	15 18.5	21 10.8	+ 7 27 5	+0.8900	0.5700	0.1183	+75	+17
49 Libræ	6	1.92	+ 1.1	16 11.8	20 4 24.2	- 9 34.2	+0.9984	0.5696	0.1068	+74	+25
φ Ophiuchi	4½	1.84	2.6	16 21.9	18 3.5	+ 3 36.7	-0.1269	0.5686	0.0858	+17	-42
24 Scorpii	5½	1.81	3.4	17 31.2	22 41.1	+ 8 4.7	+0.7171	0.5677	-0.0779	+73	+ 6
B. A. C. 6294	5½	+1.34	+ 8.0	-18 28.7	23 0 26.9	+ 8 8.8	-0.0435	0.5568	+0.0065	+14	-37
d Sagittarii	5	1.06	9.2	19 9.1	22 3.4	+ 5 2.7	+1.2103	0.5503	0.0409	+71	+49
ρ^1 Sagittarii	4	1.04	8.9	18 3.6	23 59.5	+ 6 55.3	+0.0968	0.5497	0.0440	+25	-29
ρ^2 Sagittarii	6½	1.04	9.0	18 31.1	24 0 3.7	+ 6 59.2	+0.6029	0.5497	0.0440	+60	0
B. A. C. 6710	6	0.95	9.2	18 28.9	7 19.2	- 9 59.5	+0.9262	0.5474	0.0549	+72	+21
e^1 Sagittarii	5½	+0.94	+ 8.6	-16 33.2	9 6.9	- 8 15.2	-1.0914	0.5466	+0.0577	-45	-90
B. A. C. 7063	6½	0.63	8.2	15 26.1	25 9 41.2	- 8 27.5	-0.4785	0.5385	0.0920	- 1	-65
τ^1 Capricorni	6½	0.59	8.4	15 32.4	12 45.3	- 5 29.1	-0.0755	0.5379	0.0959	+21	-39
τ^2 Capricorni	5½	0.58	8.2	15 21.2	13 42.8	- 4 33.3	-0.1879	0.5375	0.0973	+15	-46
Lalande 40522	6	0.47	7.8	14 55.3	23 25.0	+ 4 51.0	+0.3355	0.5349	0.1091	+47	-16
8 Aquarii	6½	+0.47	+ 7.3	-13 29.6	26 0 2.7	+ 5 27.5	-1.1763	0.5347	+0.1095	-48	-90
9 Aquarii	6½	0.46	7.5	13 58.5	0 38.9	+ 6 2.6	-0.5771	0.5339	0.1104	- 5	-72
18 Aquarii	5½	0.32	7.0	13 21.9	12 17.2	- 6 40.2	+0.1069	0.5317	0.1230	+34	-29
λ Capricorni	5½	0.20	6.0	11 53.4	23 42.0	+ 4 24.0	-0.0516	0.5293	0.1348	+27	-38
B. A. C. 7620	6½	0.17	5.4	10 50.8	27 3 20.4	+ 7 55.9	-0.7076	0.5286	0.1378	- 9	-90
B. A. C. 7774	6½	+0.07	+ 4.4	- 9 36.4	15 20.5	- 4 25.4	-0.3570	0.5270	+0.1483	+12	-57
67 Aquarii	6½	-0.05	3.0	7 33.5	28 5 0.2	+ 8 50.1	-0.5158	0.5261	0.1584	+ 4	-69
λ Aquarii	4	0.11	2.8	8 11.2	9 52.0	-10 26.7	+0.9535	0.5261	0.1615	+82	+21
78 Aquarii	6½	0.11	2.6	7 48.6	10 53.1	- 9 27.4	+0.7057	0.5259	0.1622	+82	+ 5
81 Aquarii	6½	0.13	2.3	7 40.4	14 25.9	- 6 0.9	+1.1316	0.5260	0.1644	+83	+35
82 Aquarii	6½	-0.14	+ 2.1	- 7 11.2	15 1.9	- 5 25.9	+0.6958	0.5261	+0.1640	+83	+ 4
φ Aquarii	4	0.18	1.5	6 39.8	21 8.9	+ 0 30.3	+1.1368	0.5264	0.1678	+84	+35
96 Aquarii	5½	0.20	1.1	5 44.9	23 46.5	+ 3 3.2	+0.5906	0.5266	0.1693	+73	- 3
B. A. C. 8184	6	0.23	+ 0.5	5 9.3	29 5 2.1	+ 8 9.7	+0.8224	0.5268	0.1714	+85	+11
VENUS				2 57.8	12 7.3	- 8 57.7	-0.3489	0.4875	0.1612	+15	-56
20 Piscium	5½	-0.29	- 0.6	- 3 23.7	14 33.8	- 6 35.6	+0.5490	0.5279	+0.1751	+71	- 6
10 Ceti	6	0.39	2.7	- 0 40.8	30 10 23.4	-11 21.5	+1.1041	0.5322	0.1786	+90	+32
B. A. C. 237	6½	-0.44	- 4.1	+ 2 45.9	22 51.2	+ 0 43.8	-0.3895	0.5356	0.1784	+13	-59
MAY.											
77 Piscium	6	-0.45	- 5.0	+ 4 18.0	1 6 5.5	+ 7 44.8	-0.7499	0.5383	+0.1773	- 7	-81
MERCURY				3 45.4	7 36.2	+ 9 12.7	+0.1005	0.5107	0.1711	+40	-28
96 Piscium	6½	0.48	6.2	6 42.2	17 32.1	- 5 9.9	-1.3065	0.5430	0.1741	-57	-84
μ Piscium	5	0.48	6.1	5 33.2	18 4.8	- 4 38.2	+0.0160	0.5431	0.1739	+36	-33
				NEW	*MOON.*						
γ Tauri	4	-0.49	-10.2	+15 21.0	4 23 24.2	- 1 55.2	+0.7875	0.5812	+0.0965	+90	+20
δ^1 Tauri	4	0.50	10.0	17 16.3	5 0 42.5	- 0 39.8	-1.0730	0.5814	0.0946	-32	-73
63 Tauri	6	0.50	10.1	16 30.4	0 55.7	- 1 58.4	-0.2600	0.5816	0.0944	+20	-39
δ^2 Tauri	5½	-0.50	-10.1	+17 10.6	1 12.3	- 0 11.1	-0.9264	0.5817	+0.0940	-20	-73
70 Tauri	6	0.49	10.3	15 40.6	1 52.9	+ 0 28.0	+0.6852	0.5820	0.0928	+90	+14
71 Tauri	6	0.49	10.3	15 21.4	2 11.8	+ 0 46.3	+1.0450	0.5820	0.0924	+90	+38
75 Tauri	6	0.49	10.0	16 6.1	3 4.6	+ 1 37.1	+0.3545	0.5825	0.0909	+57	- 5
θ^1 Tauri	4	0.49	10.3	15 42.4	3 8.1	+ 1 40.5	+0.7676	0.5825	0.0909	+90	+19
θ^2 Tauri	4	-0.49	-10.3	+15 36.9	3 10.5	+ 1 42.9	+0.8656	0.5825	+0.0907	+90	+25
80 Tauri	6	0.48	10.3	15 23.1	3 48.6	+ 2 19.6	+1.1614	0.5829	0.0895	+90	+49
B. A. C. 1391	5	0.48	10.2	15 56.6	3 58.5	+ 2 29.1	+0 6005	0.5829	0.0893	+79	+ 9
81 Tauri	6	0.48	10.3	15 26.5	4 1.3	+ 2 31.8	+1.1218	0.5829	0.0893	+90	+45
85 Tauri	6½	0.48	10.3	15 36.2	4 31.9	+ 3 1.3	+0.9993	0.5834	0.0881	+90	+35
α Tauri	1	-0.46	-10.2	+16 16.6	6 14.3	+ 4 39.9	+0.4539	0.5838	+0.0858	+65	+ 1
σ^1 Tauri	5	-0.47	-10.4	+15 41.3	7 39.8	+ 6 2.3	+1 1790	0.5845	+0.0828	+90	+52

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
B. A. C. 1526	5	-0.44	-10.4	+16 58.3	5 15 14.3	-10 40.1	+0.4338	0.5873	+0.0698	+63	+ 2
m Tauri	5	0.42	10.3	18 29.3	19 22.2	- 6 41.4	-0.8527	0.5890	0.0617	-16	-72
111 Tauri	5½	0.38	10.4	17 16.4	6 2 26.0	+ 0 6.5	+0.7861	0.5911	0.0473	+90	+24
115 Tauri	6	0.38	10.3	17 51.7	3 33.9	+ 1 11.9	+0.2358	0.5913	0.0463	+49	- 7
117 Tauri	6	0.38	10.4	17 8.5	3 56.0	+ 1 33.2	+0.9908	0.5914	0.0458	+90	+39
119 Tauri	5	-0.37	-10.3	+18 30.3	5 37.7	+ 3 11.1	-0.3313	0.5921	+0.0423	+16	-39
B. A. C. 1728	6	0.37	10.5	16 58.1	5 40.2	+ 3 13.5	+1.2448	0.5921	0.0422	+90	+65
120 Tauri	6	0.37	10.3	18 27.3	6 10.2	+ 3 42.4	-0.2578	0.5920	0.0417	+20	-34
127 Tauri	6	0.34	10.2	18 55.2	10 0.1	+ 7 23.5	-0.5885	0.5930	0.0359	+ 1	-57
130 Tauri	6	0.33	10.4	17 41.0	11 53.2	+ 9 12.3	+0.7364	0.5932	0.0302	+90	+23
χ^3 Orionis	6	-0.28	-10.1	+19 41.4	18 22.7	- 8 33.0	-1.1609	0.5946	+0.0169	-42	-71
71 Orionis	6	0.25	10.1	19 11.4	23 1.9	- 4 4.5	-0.5901	0.5950	+0.0078	+ 1	-56
26 Geminorum	5½	-0.15	10.3	17 45.2	7 10 14.1	+ 6 41.8	+0.8314	0.5958	-0.0148	+90	+31
W. vii., 685	6	+0.04	10.0	17 19.6	8 6 17.2	+ 1 58.9	+0.5516	0.5946	0.0552	+74	+10
f Geminorum	6	0.07	9.8	17 55.9	9 24.0	+ 4 58.5	-0.2436	0.5938	0.0619	+21	-35
1 Cancri	6	+0.16	-10.1	+16 5.5	16 35.4	+11 53.5	+1.1306	0.5925	-0.0754	+90	+48
3 Cancri	6	0.17	9.7	17 37.0	18 7.2	-10 38.3	-0.5338	0.5923	0.0779	+ 5	-57
5 Cancri	6	0.17	9.9	16 46.0	18 25.5	-10 20.6	+0.3041	0.5919	0.0789	+54	- 6
54 Cancri	6	0.42	9.7	15 46.2	9 14 55.4	+ 9 22.9	-0.6697	0.5865	0.1140	- 3	-71
o^1 Cancri	5½	0.45	9.6	15 45.4	17 30.9	+11 52.6	-0.9583	0.5857	0.1184	-22	-75
ξ Leonis	5	+0.63	-10.3	+11 48.1	10 8 12.9	+ 2 2.1	+1.1452	0.5812	-0.1395	+90	+42
18 Leonis	6	0.70	9.9	12 20.0	14 21.9	+ 7 57.6	-0.2750	0.5789	0.1478	+19	-46
A Leonis	4½	0.82	10.0	10 33.2	23 38.8	- 7 5.6	+0.1046	0.5761	0.1582	+41	-25
44 Leonis	6	0.92	10.0	9 21.6	11 7 11.2	+ 0 10.7	+0.0911	0.5740	0.1658	+40	-27
45 Leonis	6	0.94	9.6	10 20.4	8 13.4	+ 1 10.8	-1.0735	0.5737	0.1667	-30	-80
ρ Leonis	4	+0.96	- 9.6	+ 9 53.4	10 29.0	+ 3 21.6	-0.9977	0.5729	-0.1690	-24	-80
48 Leonis	5½	0.99	10.4	7 32.3	11 22.5	+ 4 13.1	+1.2342	0.5727	0.1698	+90	+48
49 Leonis	6	0.98	9.8	9 14.2	11 27.8	+ 4 18.2	-0.5014	0.5727	0.1698	+ 7	-64
37 Sextantis	6	1.05	10.3	6 58.2	16 19.9	+ 9 0.0	+0.9594	0.5716	0.1736	+90	+23
56 Leonis	6½	1.11	10.1	6 47.5	20 42.4	-10 46.7	+0.3718	0.5705	0.1769	+58	-13
c Leonis	5	+1.11	- 9.9	+ 6 42.7	22 47.7	- 8 45.8	+0.0828	0.5699	-0.1784	+40	-29
τ Leonis	5	1.27	10.1	3 28.9	12 10 53.3	+ 2 54.5	+1.1609	0.5672	0.1849	+90	+38
89 Leonis	6	1.30	9.8	3 41.4	13 46·2	+ 5 41.4	+0.4148	0.5667	0.1862	+61	-12
Jupiter				+ 2 52.3	22 38.1	- 9 44.9	-0.4172	0.5737	0.1887	+12	-61
13 Virginis	6	1.54	9.2	- 0 9.4	13 9 40.8	+ 0 55.0	+0.5707	0.5643	0.1902	+73	- 3
η Virginis	4	+1.55	- 9.1	- 0 2.2	10 14.7	+ 1 27.8	+0.3398	0.5644	-0.1903	+55	-16
Uranus				0 52.6	10 53.5	+ 2 5.3	+1.0740	0.5653	0.1906	+89	+28
γ Virginis	3	1.65	8.4	0 49.6	20 6.5	+10 59.4	-0.7268	0.5639	0.1894	- 6	-90
38 Virginis	6	1.71	8.2	2 56.1	14 1 18.1	- 7 59.6	+0.4465	0.5635	0.1885	+63	-10
k Virginis	6	1.75	8.2	3 12.0	4 13.2	- 5 10.5	+0.1689	0.5634	0.1875	+44	-25
46 Virginis	6	+1.74	- 8.1	- 2 45.4	4 38.7	- 4 45.9	-0.3651	0.5634	-0.1873	+14	-57
48 Virginis	6½	1.76	8.0	3 3.1	6 8.6	- 3 19.0	-0.3445	0.5634	0.1870	+16	-56
θ Virginis	4½	1.81	8.1	4 55.9	8 52.2	- 0 41.0	+1.0720	0.5635	0.1859	+85	+29
65 Virginis	6	1.85	7.4	4 19.8	14 55.7	+ 5 10.2	-0.6617	0.5636	0.1831	- 3	-83
66 Virginis	6	1.85	7.4	4 34.2	15 28.5	+ 5 41.9	-0.5165	0.5637	0.1828	+ 6	-69
l^1 Virginis	6½	+1.89	- 7.2	- 5 52.9	18 8.1	+ 8 16.0	+0.3457	0.5639	-0.1816	+55	-16
l^2 Virginis	5	1.89	7.2	5 40.2	18 50.3	+ 8 56.7	+0.0017	0.5639	0.1811	+34	-35
88 Virginis	6½	1.96	6.3	6 16.2	15 2 13.3	- 7 55.3	-0.7033	0.5642	0.1765	- 6	-89
B.A.C.4647 *mult.*	6½	2.00	6.2	7 30.0	5 13.9	- 5 0.8	+0.0361	0.5643	0.1743	+35	-33
94 Virginis	6½	2.04	5.7	8 21.0	10 19.6	- 0 5.6	+0.0344	0.5648	0.1704	+34	-33
95 Virginis	6	+2.04	- 5.6	- 8 46.3	10 31.1	+ 0 5.6	+0.4368	0.5648	-0.1699	+60	-10
κ Virginis	4	2.08	5.4	9 44.7	13 17.3	+ 2 46.1	+0.9761	0.5633	0.1679	+81	+22
ξ^1 Libræ	6	2.18	3.2	11 26.1	16 7 55.4	- 3 14.2	-0.2271	0.5670	0.1487	+18	-48
ξ^2 Libræ	5½	2.18	2.9	10 57.0	8 59.8	- 2 12.0	-0.8894	0.5670	0.1476	-21	-90
γ Libræ	4½	2.28	0.8	14 24.5	17 2 16.2	- 9 31.4	+0.3579	0.5685	0.1255	+49	-15
η Libræ	6	+2.30	- 0.3	-15 18.5	6 4.2	- 5 51.3	+0.8358	0.5688	-0.1199	+75	+13
49 Libræ	6	+2.31	+ 0.8	-16 11.8	13 19.9	+ 1 9.3	+0.9296	0.5690	-0.1094	+74	+20

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
φ Ophiuchi	4½	+2.31	+ 2.8	-16 21.9	18 3 0.6	- 9 38.4	-0.2276	0.5693	-0.0879	+12	-49
24 Scorpii	5½	2.32	3.5	17 31.2	7 37.8	- 5 10.7	+0.6101	0.5692	0.0799	+63	0
29 Ophiuchi	6½	2.32	4.8	18 43.0	16 38.8	+ 3 31.6	+1.2303	0.5685	-0.0648	+72	+52
B. A. C. 6294	5½	2.06	9.4	18 28.6	20 9 2.6	- 5 27.6	-0.2383	0.5607	+0.0047	+ 3	-50
Lalande 35497	6½	1.94	10.8	19 24.4	23 36.0	+ 8 36.6	+1.0259	0.5564	0.0294	+71	+29
B. A. C. 6536	6	+1.91	+11.0	-19 27.9	21 2 1.7	+10 57.5	+1.1649	0.5556	+0.0330	+71	+43
d Sagittarii	5	1.86	11.2	19 9.1	6 24.3	- 8 48.6	+0.9865	0.5540	0.0405	+71	+25
ρ¹ Sagittarii	4	1.85	11.2	18 3.5	8 19.6	- 6 57.1	-0.1275	0.5537	0.0430	+12	-43
ρ² Sagittarii	6½	1.85	11.2	18 31·0	8 23.3	- 6 53.5	+0.3770	0.5534	0.0437	+42	-14
B. A. C. 6710	6	1.77	11.8	18 28.9	15 34.1	+ 0 3.2	+0.6895	0.5509	0.0548	+69	+ 5
B. A. C. 7063	6½	+1.47	+11.9	-15 26.0	22 17 41.1	+ 1 20.2	-0.7347	0.5411	+0.0918	-16	-90
τ¹ Capricorni	6½	1.43	11.8	15 32.3	20 43.8	+ 4 17.2	-0.3344	0.5399	0.0949	+ 7	-56
τ² Capricorni	5½	1.42	11.8	15 21.1	21 40.9	+ 5 12.6	-0.4484	0.5394	0.0971	+ 1	-64
Lalande 40522	6	1.31	11.7	14 55.2	23 7 19.6	- 9 26.7	+0.0681	0.5363	0.1085	+31	-31
9 Aquarii	6½	1.29	11.4	13 58.4	8 33.0	- 8 15.6	-0.8431	0.5358	0.1105	-21	-90
18 Aquarii	5½	+1.16	+11.1	-13 21.8	20 8.6	+ 2 58.9	-0.1622	0.5322	+0.1231	+19	-45
λ Capricorni	5½	1.03	10.3	11 53.3	24 7 32.3	- 9 58.0	-0.3245	0.5289	0.1348	+12	-55
B. A. C. 7620	6½	0.99	9.9	10 50.7	11 10.8	- 6 26.0	-0.9808	0.5282	0.1379	-27	-90
B. A. C. 7774	6½	0.87	9.1	9 36.3	23 12.1	+ 5 13.9	-0.6306	0.5261	0.1483	- 3	-80
67 Aquarii	6½	0.74	7.6	7 33.5	25 12 55.5	- 5 26.8	-0.7814	0.5238	0.1584	-11	-90
λ Aquarii	4	+0.66	+ 7.5	- 8 11.1	17 49.2	- 0 41.7	+0.6926	0.5234	+0.1614	+81	+ 3
78 Aquarii	6½	0.67	7.4	7 48.4	18 50.7	+ 0 18.0	+0.4427	0.5232	0.1620	+61	-11
81 Aquarii	6½	0.64	7.1	7 40.3	22 24.9	+ 3 45.9	+0.8738	0.5232	0.1642	+83	+15
82 Aquarii	6½	0.63	6.9	7 11.1	23 1.2	+ 4 21.2	+0.4367	0.5231	0.1644	+61	-11
φ Aquarii	4	0.57	6.3	6 39.7	26 5 11.1	+10 20.3	+0.8833	0.5231	0.1677	+84	+15
96 Aquarii	5½	+0.55	+ 5.8	- 5 44.8	7 50.1	-11 5.4	+0.3241	0.5231	+0.1690	+53	-17
B. A. C. 8184	6	0.49	5.3	5 9.2	13 8.5	- 5 56.2	+0.5759	0.5232	0.1711	+73	- 3
20 Piscium	5½	0.41	4.1	3 23.6	22 45.7	+ 3 24.1	+0.3117	0.5242	0.1748	+53	-18
24 Piscium	6	0.39	4.1	3 47.2	27 1 21.5	+ 5 55.4	+1.1965	0.5244	0.1754	+87	+40
10 Ceti	6	0.26	1.7	- 0 40.8	18 47.8	- 1 9.2	+0.8970	0.5279	0.1786	+90	+16
B. A. C. 237	6½	+0.17	+ 0.0	+ 2 46.0	28 7 22.9	+11 3.4	-0.5811	0.5322	+0.1787	+ 3	-74
77 Piscium	6	0.13	- 1.3	4 18.1	14 41.4	- 5 51.4	-0.9284	0.5345	0.1778	-18	-86
μ Piscium	5	+0.05	2.5	5 33.3	29 2 46.4	+ 5 51.3	-0.1371	0.5398	0.1747	+27	-42
64 Ceti	5½	-0.09	4.7	8 2.1	22 40.7	+ 1 7.8	+0.6151	0.5502	0.1649	+78	+ 1
ξ¹ Ceti	4	0.09	4.8	8 18.6	23 26.9	+ 1 52.5	+0.4491	0.5507	0.1643	+64	- 8
ξ Arietis	5	-0.11	- 5.6	+10 5.5	30 4 59.5	+ 7 14.2	-0.5286	0.5539	+0.1606	+ 6	-66
B. A. C. 755	6½	0.12	5.8	10 3.0	5 54.0	+ 8 6.9	-0.3406	0.5542	0.1600	+16	-52
85 Ceti	6	0.16	6.2	10 15.2	13 11.6	- 8 50.0	+0.5892	0.5588	0.1538	+76	+ 1
38 Arietis	5	0.16	6.6	11 57.9	14 17.9	- 7 45.9	-1.0361	0.5594	0.1529	-27	-78
Lalande 5725	6	0.21	7.2	12 45.0	31 0 1.9	+ 1 38.2	-0.4102	0.5653	0.1432	+12	-55
f Tauri	4	-0.27	- 7.8	+12 32.6	10 54.4	-11·52.0	+1.2891	0.5724	+0.1303	+90	+64

JUNE.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
48 Tauri	6	-0.31	- 9.1	+15 6.9	1 6 10.5	+ 6 42.7	+0.8796	0.5839	+0.1027	+90	+25
γ Tauri	4	-0.31	- 9.1	+15 21.0	7 51.8	+ 8 20.2	+0.8072	0.5853	+0.0999	+90	+21
δ¹ Tauri	4	0.31	9.3	17 16.3	9 9.0	+ 9 34.5	-1.0375	0.5858	0.0980	-29	-73
63 Tauri	6	0.32	9.2	16 30.4	9 21.9	+ 9 47.0	-0.2308	0.5864	0.0969	+22	-38
δ² Tauri	5½	0.31	9.3	17 10.6	9 38.2	+10 2.7	-0.8919	0.5864	0.0967	-18	-73
θ¹ Tauri	4	0.32	9.3	15 42.4	11 32.2	+11 52.4	+0.7956	0.5875	0.0936	+90	+21
θ² Tauri	4	-0.32	- 9.3	+15 36.9	11 34.6	+11 54 8	+0.8931	0.5875	+0.0935	+90	+27
α Tauri	1	0.33	9.5	16 16.6	14 35.3	- 9 11.3	+0.4909	0.5889	+0.0883	+68	+ 3
				NEW	*MOON.*						
26 Geminorum	5½	0.28	10.0	17 45.2	3 17 24.2	- 8 20.4	+0.9727	0.6042	-0.0141	+90	+41
W. vii. 685	6	-0.16	- 9.4	+17 19.6	4 12 55.3	+10·24.5	+0.7308	0.6030	-0.0545	+90	+21
f Geminorum	6	-0.15	- 9.3	+17 55.9	15 57.3	-10 40.7	-0.0502	0.6023	-0.0607	+32	-24

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0.		Apparent Declination	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
g Geminorum	5	−0.13	− 9.0	+18 47.1	4 18 35.1	− 8 9.1	−1.0735	0.6019	−0.0664	−32	−72
3 Cancri	6	0.08	9.0	17 37.0	5 0 26.8	− 2 31.2	−0.3243	0.6003	0.0781	+17	−42
5 Cancri	6	0.08	9.2	16 46.0	0 44.8	− 2 13.8	+0.5049	0.6003	0.0784	+69	+ 5
ζ^1 Cancri	4½	−0.04	8.7	17 59.3	5 0.7	+ 1 52.1	−1.0715	0.5991	0.0863	−32	−72
d^1 Cancri	6	0.00	8.7	17 25.2	10 30.8	+ 7 9.4	−1.0046	0.5969	0.0970	−26	−73
54 Cancri	6	+0.12	− 8.5	+15 46.3	20 46.0	− 6 59.0	−0.4349	0.5935	−0.1146	+11	−53
o^1 Cancri	5½	0.14	8.5	15 45.5	23 18.4	− 4 32.4	−0.7176	0.5921	0.1183	− 6	−75
o^2 Cancri	6	0.13	8.4	16 1.0	23 26.4	− 4 24.7	−0.9936	0.5921	0.1191	−25	−74
π^1 Cancri	6	0.19	8.2	15 27.2	6 5 32.2	+ 1 27.2	−1.1817	0.5898	0.1285	−42	−75
π^2 Cancri	6	0.21	8.2	15 24.7	6 43.7	+ 2 36.0	−1.2924	0.5891	0.1302	−62	−75
18 Leonis	6	+0.38	− 8.3	+12 20.1	19 47.9	− 8 49.0	−0.0235	0.5832	−0.1481	+34	−31
A Leonis	4½	0.49	8.3	10 33.3	7 4 58.0	+ 0 1.0	+0.3595	0.5792	0.1587	+57	−11
44 Leonis	6	0.58	8.2	9 21.7	12 26.3	+ 7 13.1	+0.3499	0.5758	0.1666	+56	−13
45 Leonis	6	0.60	7.8	10 20.5	13 28.1	+ 8 12.8	−0.8128	0.5754	0.1675	−11	−81
ρ Leonis	4	0.62	7.7	9 53.5	15 42.7	+10 22.5	−0.7357	0.5744	0.1694	− 6	−79
49 Leonis	6	+0.64	− 7.9	+ 9 14.3	16 41.2	+11 18.9	−0.2408	0.5741	−0.1703	+22	−46
37 Sextantis	6	0.71	8.4	6 58.3	21 31.7	− 8 0.9	+1.2173	0.5720	0.1742	+90	+45
56 Leonis	6½	0.77	8.1	6 47.6	8 1 53.7	− 3 48.0	+0.6328	0.5706	0.1772	+80	+ 2
c Leonis	5	0.80	8.1	6 42.8	3 58.8	− 1 47.4	+0.3427	0.5698	0.1786	+56	−15
χ Leonis	5	0.81	7.4	7 57.0	5 52.7	+ 0 2.6	−1.2517	0.5688	0.1799	−48	−82
σ Leonis	4	+0.91	− 7.4	+ 6 39.1	13 2.5	+ 6 57.4	−1.2391	0.5666	−0.1837	−46	−84
Mars				4 58.3	16 7.9	+ 9 56.4	−0.1035	0.5507	0.1772	+28	−39
89 Leonis	6	1.01	7.9	3 41.5	18 59.0	−11 18.3	+0.6696	0.5647	0.1862	+84	+ 3
Jupiter				2 38.6	9 4 21.8	− 2 14.8	−0.0238	0.5606	0.1879	+34	−37
10 Virginis	6½	1.22	7.0	+ 2 32.2	10 57.6	+ 4 7.4	−1.1649	0.5609	0.1897	−37	−88
13 Virginis	6	+1.30	− 7.5	− 0 9.3	15 3.4	+ 8 5.0	+0.8119	0.5603	−0.1900	+90	+11
η Virginis	4	1.30	7.4	0 2.1	15 37.5	+ 8 37.9	+0.5784	0.5601	0.1900	+74	− 3
Uranus				0 45 7	15 42.9	+ 8 43.1	+1.3050	0.5603	0.1900	+89	+53
γ Virginis	3	1.42	6.6	0 49.6	10 1 37.2	− 5 42.5	−0.5013	0.5586	0.1891	+ 7	−68
38 Virginis	6	1.49	6.4	2 56.1	6 53.6	− 0 36.7	+0.6683	0.5580	0.1879	+83	+ 2
k Virginis	6	+1.55	− 6.4	− 3 12.0	9 51.6	+ 2 15.4	+0.3842	0.5577	−0.1870	+58	−14
46 Virginis	6	1.57	6.2	2 45.4	10 17.7	+ 2 40.5	−0.1527	0.5577	0.1870	+26	−44
48 Virginis	6½	1.57	6.1	3 3.1	11 49.0	+ 4 8.8	−0.1339	0.5576	0.1864	+27	−43
θ Virginis	4½	1.62	6.6	4 55.9	14 35.4	+ 6 49.6	+1.2885	0.5574	0.1854	+85	+52
65 Virginis	6	1.68	5.7	4 19.8	20 45.5	−11 12.5	−0.4666	0.5574	0.1827	+ 9	−65
66 Virginis	6	+1.69	− 5.7	− 4 34.2	21 19.1	−10 40.1	−0.3203	0.5574	−0.1826	+17	−54
l^1 Virginis	6½	1.74	5.8	5 52.9	11 0 1.6	− 8 3.1	+0.5430	0.5573	0.1812	+70	− 5
l^2 Virginis	5	1.75	5.7	5 40.2	0 44.7	− 7 21·4	+0.1931	0.5573	0.1807	+45	−24
80 Virginis	6	1.75	5.3	4 49.0	2 23.1	− 5 46.3	+0.9849	0.5573	0.1796	−23	−90
88 Virginis	6½	1.84	5.0	6 12.6	8 16.4	− 0 4.8	−0.5289	0.5573	0.1763	+ 5	−70
B.A.C.4647 *mult.*	6½	+1.89	− 5.0	− 7 30.0	11 20.8	+ 2 53.5	−0.2094	0.5577	−0.1743	+45	−23
94 Virginis	6½	1.95	4.6	8 21.0	16 32.8	+ 7 55.1	+0.1977	0.5580	0.1699	+44	−24
95 Virginis	6	1.96	4.7	8 46.3	16 44.6	+ 8 6.5	+0.6033	0.5580	0.1699	+73	− 2
κ Virginis	4	2.00	4.5	9 44.7	19 34.1	+10 50.4	+1.1400	0.5581	0.1675	+82	+35
ξ^1 Libræ	6	2.21	2.3	11 26.0	12 14 35.6	+ 5 13.6	−0.1136	0.5603	0.1490	+24	−42
ξ^2 Libræ	5½	+2.20	− 2.1	−10 57.0	15 41.4	+ 6 17.2	−0.7829	0.5604	−0.1478	−14	−90
18 Libræ	6	2.20	1.9	10 41.2	16 40.3	+ 7 14.1	−1.2050	0.5608	0.1468	−47	−90
γ Libræ	4½	2.41	− 0.3	14 24.5	13 9 18.1	− 0 41.8	+0.4344	0.5625	0.1265	+55	−11
η Libræ	6	2.44	+ 0.1	15 18.5	13 10.2	+ 3 2.4	+0.9072	0.5631	0.1212	+75	+18
49 Libræ	6	2.49	1.1	16 11.8	20 33.2	+10 10.3	+0.9835	0.5636	0.1102	+74	+24
ϕ Ophiuchi	4½	+2.56	+ 3.2	−16 21.8	14 10 26.2	− 0 25.1	−0.2167	0.5652	−0.0892	+12	−48
24 Scorpii	5½	2.60	3.8	17 31.2	15 7.2	+ 4 6 3	+0.6172	0.5652	0.0822	+64	0
29 Ophiuchi	6½	2.64	5.0	18 43.0	15 0 14.3	−11 5.2	+1.2207	0.5655	−0.0675	+72	+50
B. A. C. 6294	5½	2.59	10.8	18 28.6	16 16 50.8	+ 4 8.3	−0.3457	0.5613	+0.0029	− 3	−57
Lalande 35497	6½	2.54	12.4	19 24.4	17 7 23.7	− 5 47.9	+0.8874	0.5578	0.0278	+71	+18
B. A. C. 6536	6	+2.52	+12.7	−19 27.9	9 49.0	− 3 27.4	+1.0226	0.5572	+0.0287	+71	+28
d Sagittarii	5	+2.50	+12.9	−19 9.1	14 11.1	− 0 46.0	+0.8364	0.5562	+0.0383	+71	+14

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
ρ^1 Sagittarii	4	+2.48	+13.0	-18 3.5	**17** 16 5.9	+ 2 37.0	-0.2844	0.5556	+0.0414	+ 4	-53
ρ^2 Sagittarii	6½	2.48	13.0	18 31.0	16 9.8	+ 2 40.8	+0.2206	0.5554	0.0414	+32	-22
B. A. C. 6707	6½	2.44	13.7	19 6.0	23 0.5	+ 9 18.0	+1.1836	0.5532	0.0524	+71	+45
B. A. C. 6710	6	2.44	13.7	18 28.9	23 19.0	+ 9 35.9	+0.5224	0.5530	0.0528	+54	- 5
B. A. C. 7063	6½	2.20	14.8	15 26.0	**19** 1 18.7	+10 45.5	-0.9502	0.5439	0.0906	-31	-90
τ^1 Capricorni	6½	+2.19	+15.0	-15 32.3	4 20.5	-10 18.4	-0.5517	0.5427	+0.0945	- 5	-73
τ^2 Capricorni	5½	2.20	15.0	15 21.1	5 17.3	- 9 23.4	-0.6696	0.5424	0.0958	-12	-87
Lalande 40522	6	2.08	15.2	14 55.2	14 53.1	- 0 5.5	-0.1677	0.5388	0.1079	+17	-45
9 Aquarii	6½	2.07	15.0	13 58.4	16 6.4	+ 1 5.5	-1.0817	0.5386	0.1092	-39	-90
18 Aquarii	5½	1.96	15.0	13 21.8	**20** 3 39.1	-11 43.0	-0.4151	0.5341	0.1226	+ 5	-62
λ Capricorni	5½	+1.85	+14.8	-11 53.3	15 1.2	- 0 41.4	-0.5889	0.5304	+0.1341	- 3	-76
B. A. C. 7620	6½	1.81	14.4	10 50.7	18 39.2	+ 2 50.1	-1.2520	0.5290	0.1376	-54	-90
B. A. C. 7774	6½	1.70	13.9	9 36.3	**21** 6 40.5	- 9 30.1	-0.9084	0.5260	0.1479	-21	-90
67 Aquarii	6½	1.57	12.8	7 33 4	20 26.1	+ 3 51.4	-1.0735	0.5229	0.1579	-32	-90
λ Aquarii	4	1.50	12.8	8 11 0	**22** 1 21.1	+ 8 37.9	+0.4037	0.5224	0.1606	+58	-13
78 Aquarii	6½	+1.49	+12.6	- 7 48.4	2 22.9	+ 9 37.8	+0.1548	0.5219	+0.1615	+42	-26
81 Aquarii	6½	1.48	12 4	7 40.2	5 58.4	-10 52.9	+0.5859	0.5216	0.1634	+72	- 3
82 Aquarii	6½	1.47	12.2	7 11.0	6 34 8	-10 17.5	+0.1473	0.5215	0.1638	+42	-27
φ Aquarii	4	1.41	11.7	6 39.4	12 47.3	- 4 15.8	+0.5944	0.5208	0.1673	+74	- 2
96 Aquarii	5½	1.39	11.3	5 44.7	15 27.5	- 1 40.2	+0.0331	0.5207	0.1683	+36	-33
B. A. C. 8184	6	+1.33	+10.8	- 5 9.1	20 48.7	+ 3 31 7	+0.2848	0.5206	+0.1705	+51	-19
20 Piscium	5½	1.25	9.6	3 23.5	**23** 6 32.1	-11 1.8	+0.0220	0.5207	0.1739	+36	-34
24 Piscium	6	1.22	9.6	3 47.1	9 9.7	- 8 28.8	+0.9101	0.5209	0.1745	+87	+17
10 Ceti	6	1.06	7.0	- 0 40.7	**24** 2 50.4	+ 8 41.2	+0.6226	0.5235	0.1777	+79	- 1
B. A. C. 237	6½	0.96	4.8	+ 2 46.1	15 38.0	- 2 53.8	-0.8562	0.5264	0.1778	-13	-88
77 Piscium	6	+0.91	+ 3.7	+ 4 18.2	23 4.1	+ 4 19.1	-1.2001	0.5288	+0.1768	-41	-86
f Piscium	5	0.83	3.7	3 1.0	**25** 5 10.4	+10 14.4	+1.2679	0.5309	0.1757	+90	+50
μ Piscium	5	0.80	2.3	5 33.3	11 22.3	- 7 45.0	-0.3855	0.5337	0.1739	+14	-58
ν Piscium	4½	0.73	+ 2.1	4 54.7	17 0.7	- 2 17.0	+1.2803	0.5363	0.1720	+90	+53
64 Ceti	5½	0.63	- 0.3	8 2.2	**26** 7 38.5	+11 53.5	+0.4024	0.5442	0.1645	+60	-11
ξ^1 Ceti	4	+0.62	- 0.5	+ 8 18.7	8 25.6	-11 21.0	+0.2375	0.5446	+0.1641	+49	-20
ξ Arietis	5	0.59	1.4	10 5.6	14 3.9	- 5 53.4	-0.7382	0.5478	0.1606	- 6	-79
B. A. C. 755	6½	0.55	1.5	10 3.1	14 59.4	- 4 59.8	-0.5455	0.5486	0.1598	+ 5	-67
85 Ceti	6	0.51	2.2	10 15.3	22 24.1	+ 2 10 4	+0.4042	0.5534	0.1538	+60	- 9
38 Arietis	5	0.52	2.8	11 58.0	23 31.6	+ 3 15.7	-1.2272	0.5541	0.1530	-46	-78
μ Ceti	4	+0.49	- 2.1	+ 9 38.0	23 32.4	+ 3 16.5	+1.2325	0.5541	+0.1530	+90	+50
Lalande 5725	6	0.45	3.9	12 45.0	**27** 9 24.2	-11 11.4	-0.5793	0.5607	0.1434	+ 3	-67
f Tauri	4	0.35	4.8	12 32.6	20 24.7	- 0 33.6	+1.1503	0.5685	0.1311	+90	+43
48 Tauri	6	0.18	6.8	15 6.9	**28** 15 49.9	- 5 50.0	+0.7805	0.5818	0.1045	+90	+18
γ Tauri	4	0.19	6.9	15 21.1	17 31.7	- 4 11.9	+0.7112	0.5832	0.1015	+90	+14
δ^1 Tauri	4	+0.19	- 7.3	+17 16.4	18 49.1	- 2 57.4	-1.1295	0.5840	+0.0996	-37	-73
63 Tauri	6	0.18	7.2	16 30.5	19 2.2	- 2 44.7	-0.3229	0.5840	0.0995	+17	-44
δ^2 Tauri	5½	0.19	7.3	17 10.7	19 18.6	- 2 28.9	-0.9822	0.5841	0.0991	-24	-73
70 Tauri	6	0.17	7.1	15 40.7	19 58.7	- 1 50.3	+0.6216	0.5845	0.0978	+81	+10
71 Tauri	6	0.16	7.1	15 21.5	20 17.3	- 1 32.4	+0.9781	0.5845	0.0974	+90	+33
75 Tauri	6	+0.18	- 7.7	+16 6.2	21 9.5	- 0 42.1	+0.3003	0.5853	+0.0961	+54	- 8
θ^1 Tauri	4	0.16	7.2	15 42.5	21 13.0	- 0 38.8	+0.7098	0.5853	0.0959	+90	+15
θ^2 Tauri	4	0.16	7.2	15 37.0	21 15.3	- 0 36.6	+0.8070	0.5853	0.0959	+90	+21
80 Tauri	6	0.15	7.1	15 23.2	21 52.9	- 0 0.3	+1.1018	0.5859	0.0946	+90	+44
B. A. C. 1391	5	0.16	7.2	15 56.7	22 2.6	+ 0 9.1	+0.5488	0.5861	0.0945	+73	+ 6
81 Tauri	6	+0.15	- 7.1	+15 26.6	22 5.3	+ 0 11.7	+1.0624	0.5861	+0.0945	+90	+40
85 Tauri	6½	0.14	7.3	15 36.3	22 35.6	+ 0 40.8	+0.9445	0.5867	0.0932	+90	+31
α Tauri	1	0.14	7.5	16 16.7	**29** 0 16.4	+ 2 17.9	+0.4105	0.5873	0.0910	+62	- 1
σ^1 Tauri	5	0.12	7.4	15 34.4	1 37.8	+ 3 36.3	+1.2505	0.5887	0.0881	+90	+61
σ^2 Tauri	5	0.12	7.4	15 41.4	1 40.5	+ 3 38.8	+1.1350	0.5887	0.0881	+90	+47
B. A. C. 1526	5	+0.08	- 8.0	+16 58.4	9 6.5	+10 48.0	+0.4321	0.5931	+0.0751	+63	+ 1
m Tauri	5	+0.07	- 8.3	+18 29.4	13 8.9	- 9 18.8	-0.8216	0.5954	+0.0676	-13	-72
				NEW	*MOON.*						

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
ζ^1 Cancri	4½	-0.06	- 8.3	+17 59.3	2 13 24.2	-11 56.7	-0.9356	0.6083	-0.0860	-21	-72
d^2 Cancri	6	-0.04	8.1	17 25.2	18 44.9	- 6 48.8	-0.8580	0.6067	0.0962	-15	-73
54 Cancri	6	+0.01	7.7	15 46.3	3 4 41.4	+ 2 44.1	-0.2755	0.6031	0.1147	+19	-42
o^1 Cancri	5½	0.03	7.7	15 45.5	7 9.2	+ 5 6.1	-0.5511	0.6023	0.1186	+ 4	-62
o^2 Cancri	6	0.03	7.6	16 1.0	7 17.0	+ 5 13.6	-0.8216	0.6023	0.1188	-12	-74
π^1 Cancri	6	+0.08	- 7.3	+15 27.2	13 11.4	+10 54.1	-0.9954	0.5998	-0.1287	-24	-75
π^2 Cancri	6	0.09	7.2	15 24.7	14 20.7	-11 59.2	-1.1043	0.5992	0.1304	-34	-75
18 Leonis	6	0.18	7.1	12 20.1	4 3 0.2	+ 0 10.9	+0.1687	0.5931	0.1492	+45	-20
ν Leonis	5	0.22	6.7	12 59.3	7 51.5	+ 4 51.2	-1.2184	0.5907	0.1555	-45	-77
A Leonis	4½	0.27	6.9	10 33.3	11 53.4	+ 8 44.0	+0.5616	0.5887	0.1600	+73	0
44 Leonis	6	+0.35	- 6.6	+ 9 21.7	19 8.4	- 8 17.2	+0.5611	0.5849	-0.1677	+73	- 1
45 Leonis	6	0.37	6.4	10 20.5	20 8.4	- 7 19.3	-0.5830	0.5847	0.1687	+ 3	-70
p Leonis	4	0.38	6.3	9 53.5	22 19.3	- 5 13.3	-0.5069	0.5835	0.1708	+ 7	-64
49 Leonis	6	0.41	6.4	9 14.3	23 16.1	- 4 18.6	-0.0183	0.5830	0.1717	+34	-33
56 Leonis	6½	0.51	6.5	6 47.6	5 8 13.3	+ 4 19.0	+0.8553	0.5786	0.1789	+90	+15
c Leonis	5	+0.53	- 6.3	+ 6 42.8	10 15.2	+ 6 16.5	+0.5706	0.5776	-0.1803	+74	- 2
χ Leonis	5	0.54	5.7	7 57.0	12 6.1	+ 8 3.4	-1.0032	0.5769	0.1815	-24	-82
σ Leonis	4	0.62	5.6	6 39.1	19 5.3	- 9 12.4	-0.9858	0.5736	0.1853	-22	-84
89 Leonis	6	0.72	6.0	3 41.5	6 0 53.7	- 3 36.2	+0.9057	0.5711	0.1879	+90	+17
JUPITER				1 36.0	13 55.7	+ 8 58.4	+0.5503	0.5620	0.1889	+72	- 5
10 Virginis	6½	+0.92	- 5.1	+ 2 32.2	16 34.2	+11 31.5	-0.9051	0.5651	-0.1912	-17	-88
13 Virginis	6	1.01	5.6	- 0 9.3	20 36.0	- 8 35.0	+1.0556	0.5639	0.1913	+90	+27
η Virginis	4	1.01	5.5	0 2.1	21 9.9	- 8 2.3	+0.8260	0.5639	0.1912	+90	+12
γ Virginis	3	1.15	4.8	0 49.6	7 7 1.9	+ 1 29.5	-0.2516	0.5612	0.1902	+21	-50
38 Virginis	6	1.21	4.6	2 56.1	12 15.2	+ 6 32.2	+0.9135	0.5600	0.1890	+87	+17
k Virginis	6	+1.27	- 4.7	- 3 12.0	15 11.7	+ 9 22.7	+0.6317	0.5594	-0.1880	+79	0
46 Virginis	6	1.26	4.5	2 45.4	15 37.5	+ 9 47.6	+0.0956	0.5591	0.1879	+40	-30
48 Virginis	6½	1.29	4.4	3 3.1	17 8.3	+11 15.4	+0.1145	0.5591	0.1876	+41	-29
65 Virginis	6	1.42	3.9	4 19.8	8 2 1.9	- 4 8.8	-0.2230	0.5577	0.1836	+22	-48
66 Virginis	6	1.43	3.9	4 34.2	2 35.2	- 3 36.6	-0.0789	0.5576	0.1831	+30	-40
l^1 Virginis	6½	+1.48	- 4.1	- 5 52.9	5 17.3	- 1 0.0	+0.7802	0.5574	-0.1820	+84	+ 9
l^2 Virginis	5	1.49	3.9	5 40.2	6 0.4	- 0 18.4	+0.4314	0.5572	0.1813	+61	-11
80 Virginis	6	1.50	3.4	4 49.0	7 38.6	+ 1 16.6	-0.7447	0.5572	0.1805	- 7	-90
88 Virginis	6½	1.60	3.2	6 16.2	13 31.6	+ 6 57.8	-0.2950	0.5567	0.1766	+17	-53
B.A.C.4647 *mult.*	6½	1.65	3.2	7 30.0	16 36.1	+ 9 56.2	+0.4388	0.5563	0.1745	+61	-11
94 Virginis	6½	+1.72	- 2.9	- 8 20.9	21 48.9	- 9 1.5	+0.4208	0.5560	-0.1706	+59	-12
95 Virginis	6	1.73	3.0	8 46.3	22 0.2	- 8 50.5	+0.8281	0.5562	0.1705	+82	+12
ξ^1 Libræ	6	2.04	1.2	11 26.0	9 20 0.0	-11 34.7	+0.0840	0.5564	0.1496	+35	-30
ξ^2 Libræ	5½	2.05	0.9	10 57.0	21 6.4	-10 30.5	-0.5901	0.5567	0.1485	- 2	-76
18 Libræ	6	2.06	- 0.7	10 41.2	22 5.9	- 9 33.0	-1.0125	0.5567	0.1473	-29	-90
γ Libræ	4½	+2.28	+ 0.8	-14 24.5	10 14 54.6	+ 6 42.0	+0.6714	0.5581	-0.1269	+68	- 1
η Libræ	6	2.35	0.9	15 18.5	18 49.7	+10 29.2	+1.0730	0.5583	0.1216	+75	+31
48 Libræ	5½	2.39	2.2	13 57.0	11 1 20.1	- 7 13.3	-1.1311	0.5589	0.1131	-43	-90
49 Libræ	6	2.44	1.6	16 11.8	2 18.6	- 6 16.9	+1.1387	0.5591	0.1115	+74	+37
ϕ Ophiuchi	4½	2.55	3.8	16 21.8	16 23.1	+ 7 19.2	-0.0927	0.5600	0.0901	+19	-40
24 Scorpii	5½	+2.61	+ 4.4	-17 31.2	21 8.0	+11 54.6	+0.7343	0.5605	-0.0833	+72	+ 7
B. A. C. 6294	5½	2.87	11.4	18 28.6	13 23 27.7	-11 27.2	-0.3290	0.5587	+0.0011	- 3	-56
Lalande 35497	6½	2.89	13.2	19 24.4	14 14 7.4	+ 2 43.3	+0.8814	0.5565	0.0252	+71	+17
B. A. C. 6536	6	2.90	13.5	19 27.9	16 33.5	+ 5 4.6	+1.0110	0.5555	0.0296	+71	+28
d Sagittarii	5	2.89	13.9	19 9.1	20 57.2	+ 9 19.6	+0.8134	0.5549	0.0364	+71	+13
ρ^1 Sagittarii	4	+2.88	+14.1	-18 3.5	22 52.5	+11 11.1	-0.3127	0.5544	+0.0395	+ 2	-55
ρ^2 Sagittarii	6½	2.88	14.1	18 31.0	22 56.4	+11 14.9	+0.1939	0.5544	0.0397	+30	-24
B. A. C. 6707	6½	2.88	14.9	19 6.0	15 5 48.9	- 6 6.0	+1.1450	0.5528	0.0506	+71	+41
B. A. C. 6710	6	2.87	14.9	18 28.9	6 7.5	- 5 48.1	+0.4801	0.5528	0.0511	+50	- 8
B. A. C. 7063	6½	2.75	17.1	15 25.9	16 8 10.1	- 4 35.5	-1.0442	0.5448	0.0890	-38	-90
τ^1 Capricorni	6½	+2.75	+17.3	-15 32.2	11 11.9	- 1 39.4	-0.6524	0.5437	+0.0932	-11	-85
τ^2 Capricorni	5½	+2.74	+17.4	-15 21.0	12 8.6	- 0 44.5	-0.7704	0.5433	+0.0944	-18	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0. Δα	Red'ns from 1886.0. Δδ	Apparent Declination	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
Lalande 40522	6	+2.67	+17.7	-14 55.1	16 21 44.0	+ 8 33.0	-0.2824	0.5400	+0.1067	+11	-52
9 Aquarii	6½	2.66	17.7	13 58.3	22 57.2	+ 9 43.9	-1.2014	0.5395	0.1081	-51	-90
18 Aquarii	5½	2 59	18.1	13 21.7	17 10 28.9	- 3 5.6	-0.5526	0.5357	0.1216	- 2	-73
λ Capricorni	5½	2.51	18.1	11 53.2	21 49.9	+ 7 54.8	-0.7437	0.5320	0.1332	-12	-90
e^2 Aquarii	5½	2.41	18.1	12 7.2	18 10 12.0	- 4 5.2	+1.2306	0.5282	0.1441	+78	+46
B. A. C. 7774	6½	+2.40	+17.7	- 9 36.2	13 27.9	- 0 55.0	-1.0879	0.5270	+0.1471	-34	-90
67 Aquarii	6½	2.30	17.2	7 33.3	19 3 13.3	-11 33.8	-1.2691	0.5242	0.1569	-53	-90
λ Aquarii	4	2.25	17.1	8 10.9	8 8.6	- 6 47.1	+0.2071	0.5231	0.1600	+45	-23
78 Aquarii	6½	2.24	17.0	7 48.3	9 10.4	- 5 47.2	-0.0462	0.5229	0.1605	+30	-38
81 Aquarii	6½	2.23	16.9	7 40.1	12 46.3	- 2 17.5	+0.3845	0.5219	0.1627	+57	-14
82 Aquarii	6½	+2.22	+16.7	- 7 10.9	13 22.9	- 1 42.0	-0.0536	0.5219	+0.1628	+30	-38
φ Aquarii	4	2.18	16.4	6 39.5	19 36.2	+ 4 20.6	+0.3880	0.5212	0.1662	+57	-14
96 Aquarii	5½	2.16	16.2	5 44.6	22 17.2	+ 6 57.0	-0.1791	0.5208	0.1673	+24	-45
B. A. C. 8184	6	2.12	15.6	5 9.0	20 3 39.5	-11 50.0	+0.0683	0.5202	0.1697	+38	-31
20 Piscium	5½	2.03	14.5	3 23.5	13 26.3	- 2 19.9	-0.2008	0.5200	0.1730	+23	-47
24 Piscium	6	+2.01	+14.5	- 3 47.1	16 5.1	+ 0 14.3	+0.6923	0.5199	+0.1737	+85	+ 3
B. A. C. 5	5½	1.93	13.7	2 51.3	21 0 27.9	+ 8 22.6	+1.1282	0.5199	0.1755	+87	+34
10 Ceti	6	1.88	12.3	- 0 40.6	9 56.2	- 6 25.4	-0.3941	0.5206	0.1765	+60	-13
B. A. C. 237	6½	1.78	10.0	+ 2 46.2	22 54.1	+ 6 9.9	-1.0967	0.5229	0.1765	-31	-88
f Piscium	5	1.66	8.9	3 1.0	22 12 40.2	- 4 28.2	+1.0510	0.5264	0.1743	+90	+28
μ Piscium	5	+1.63	+ 7.5	+ 5 33.4	18 59.3	+ 1 39.7	-0.6173	0.5283	+0.1724	+ 1	-77
ν Piscium	4½	1.57	7.3	4 54.8	23 0 44.6	+ 7 14.7	+1.0668	0.5307	0.1704	+90	+30
64 Ceti	5½	1.45	4.6	8 2.3	15 42.4	- 2 15.0	+0.1881	0.5373	0.1630	+46	-22
ξ^1 Ceti	4	1.45	4.3	8 18.8	16 30.5	- 1 28.3	+0.0215	0.5380	0.1625	+36	-31
ξ Arietis	5	1.43	3.2	10 5.7	22 17.1	+ 4 7.5	-0.9585	0.5405	0.1591	-21	-80
B. A. C. 755	6½	+1.41	+ 3.1	+10 3.2	23 14.0	+ 5 2.6	-0.7634	0.5411	+0.1584	- 8	-80
85 Ceti	6	1.34	2.2	10 15.3	24 6 50.0	-11 35.9	+0.2025	0.5454	0.1525	+47	-20
μ Ceti	4	1.31	2.2	9 38.0	8 0.1	-10 28.0	+1.0435	0.5462	0.1517	+90	+31
Lalande 5725	6	1.24	+ 0.2	12 45.1	18 7.1	- 0 40.7	-0.7778	0.5522	0.1427	- 9	-78
f Tauri	4	1.11	- 1.1	12 32.7	25 5 24.9	+10 14.5	+0.9822	0.5602	0.1302	+90	+29
48 Tauri	6	+0.93	- 3.7	+15 6.9	26 1 19.5	+ 5 27.7	+0.6375	0.5737	+0.1045	+83	+10
γ Tauri	4	0.91	4.0	15 21.1	3 3.7	+ 7 8.1	+0.5696	0.5751	0.1019	+75	+ 6
58 Tauri	6	0.90	3.9	14 49.2	3 25.2	+ 7 28.8	+1.1558	0.5758	0.1008	+90	+48
63 Tauri	6	0.91	4.4	16 30.5	4 36.3	+ 8 37.4	-0.4724	0.5765	0.0991	+ 8	-54
δ^2 Tauri	5½	0.91	4.6	17 10.7	4 53.0	+ 8 53.5	-1.1376	0.5767	0.0990	-38	-73
70 Tauri	6	+0.88	- 4.3	+15 40.7	5 34.0	+ 9 33.1	+0.4807	0.5772	+0.0977	+67	+ 2
71 Tauri	6	0.88	4.3	15 21.5	5 53.1	+ 9 51.4	+0.8424	0.5773	0.0973	+90	+23
75 Tauri	6	0.91	5.2	16 6.2	6 46.4	+10 42.9	+0.1584	0.5781	0.0959	+44	-16
θ^1 Tauri	4	0.87	4.5	15 42.5	6 50.0	+10 46.3	+0.5715	0.5781	0.0959	+75	+ 7
θ^2 Tauri	4	0.87	4.5	15 37.0	6 52.4	+10 48.6	+0.6712	0.5781	0.0959	+87	+13
80 Tauri	6	+0.87	- 4.5	+15 23.2	7 30.7	+11 25.5	+0.9687	0.5785	+0.0946	+90	+32
B. A. C. 1391	5	0.87	4.6	15 56.7	7 40.7	+11 35.1	+0.4078	0.5786	0.0946	+61	- 2
81 Tauri	6	0.86	4.5	15 26.6	7 43.6	+11 37.9	+0.9305	0.5786	0.0944	+90	+29
85 Tauri	6½	0.86	4.6	15 36.3	8 14.6	-11 52.2	+0.8117	0.5786	0.0939	+90	+22
α Tauri	1	0.85	4.9	16 16.7	9 57.7	-10 12.8	+0.2749	0.5802	0.0909	+52	- 9
σ^1 Tauri	5	+0.82	- 4.8	+15 34.4	11 20.9	- 8 52.7	+1.1241	0.5808	+0.0889	+90	+46
σ^2 Tauri	5	0.82	4.9	15 41.4	11 23.5	- 8 50.2	+1.0090	0.5810	0.0882	+90	+36
B. A. C. 1526	5	0.76	5.7	16 58.4	18 58.8	- 1 31.6	+0.3107	0.5863	0.0765	+54	- 6
m Tauri	5	0.73	6.4	18 29.4	23 5.9	+ 2 26.2	-0.9450	0.5891	0.0685	-22	-72
111 Tauri	5½	0.65	6.7	17 16.5	27 6 6.0	+ 9 10.4	+0.7269	0.5933	0.0552	+90	+20
115 Tauri	6	+0.64	- 6.9	+17 51.8	7 13.0	+10 14.9	+0.1879	0.5939	+0.0533	+46	-10
117 Tauri	6	0.63	6.8	17 8.6	7 34.6	+10 35.7	+0.9380	0.5943	0.0520	+90	+35
119 Tauri	5	0.62	7.3	18 30.4	9 15.0	-11 47.7	-0.3619	0.5951	0.0492	+14	-42
B. A. C. 1728	6	0.61	6.9	16 58.2	9 17.5	-11 45.3	+1.1989	0.5951	0.0492	+90	+55
120 Tauri	6	0.61	7.2	18 27.4	9 46.9	-11 17.2	-0.2841	0.5957	0.0478	+19	-37
127 Tauri	6	+0.58	- 7.5	+18 55.3	13 32.8	- 7 39.9	-0.5885	0.5979	+0.0401	+ 1	-58
130 Tauri	6	+0.56	- 7.4	+17 41.1	15 23.5	- 5 53.5	+0.7343	0.5991	+0.0362	+90	+22

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
χ^3 Orionis	6	+0.51	- 8.0	+19 41.5	27 21 43.8	+ 0 11.9	-1.0990	0.6020	+0.0235	-36	-71
68 Orionis	6	0.48	8.1	19 48.8	28 1 7.0	+ 3 27.0	-1.1505	0.6035	0.0166	-41	-71
71 Orionis	6	0.46	8.0	19 11.5	2 14.9	+ 4 32.3	-0.5088	0.6041	0.0144	+ 6	-49
26 Geminorum	5½	+0.34	- 8.2	+17 45.3	13 2.8	- 9 5.7	+0.9550	0.6115	+0.0091	+90	+39
				NEW	*MOON.*						
					AUGUST.						
44 Leonis	6	+0.26	- 5.9	+ 9 21.7	1 4 12.3	+ 2 34.6	+0.6567	0.5952	-0.1692	+84	+ 5
45 Leonis	6	+0.26	- 5.7	+10 20.5	5 10.5	+ 3 30.7	-0.4717	0.5944	-0.1702	+ 9	-61
ρ Leonis	4	0.27	5.6	9 53.5	7 17.3	+ 5 32.6	-0.3915	0.5936	0.1722	+13	-56
49 Leonis	6	0.29	5.6	9 14.3	8 12.4	+ 6 25.6	+0.0917	0.5932	0.1733	+40	-27
56 Leonis	6½	0.36	5.4	6 47.6	16 52.6	- 9 13.8	+0.9640	0.5887	0.1808	+90	+23
c Leonis	5	0.37	5.2	6 42.8	18 50.5	- 7 20.3	+0.6853	0.5880	0.1823	+87	+ 5
χ Leonis	5	+0.38	- 4.8	+ 7 57.0	20 37.9	- 5 36.9	-0.8616	0.5870	-0.1837	-14	-82
σ Leonis	4	0.43	4.5	6 39.1	2 3 23.3	+ 0 53.4	-0.8358	0.5837	0.1877	-12	-84
89 Leonis	6	0.50	4.6	3 41.5	9 0.2	+ 6 18.0	+1.0325	0.5815	0.1903	+90	+27
10 Virginis	6½	0.66	3.5	+ 2 32.2	3 0 9.8	- 3 5.2	-0.7350	0.5751	0.1937	- 6	-85
JUPITER				- 0 4.4	3 57.4	+ 0 34.3	+1.1370	0.6082	0.1913	+90	+35
13 Virginis	6	+0.73	- 3.8	- 0 9.3	4 3.9	+ 0 40.6	+1.1984	0.5738	-0.1938	+90	+41
η Virginis	4	0.75	3.7	0 2.1	4 36.5	+ 1 12.0	+0.9736	0.5735	0.1938	+90	+22
γ Virginis	3	0.84	3.0	0 49.6	14 10.2	+10 25.5	-0.0821	0.5706	0.1929	+30	-40
38 Virginis	6	0.90	2.9	2 56.0	19 14.1	- 8 41.3	+1.0673	0.5689	0.1916	+87	+28
k Virginis	6	0.94	2.8	3 11.9	22 5.5	- 5 55.8	+0.7896	0.5682	0.1907	+87	+ 9
46 Virginis	6	+0.94	- 2.7	- 2 45.3	22 30.5	- 5 31.7	+0.2627	0.5678	-0.1904	+50	-20
48 Virginis	6½	0.96	2.6	3 3.0	23 58.8	- 4 6.5	+0.2815	0.5676	0.1900	+51	-19
65 Virginis	6	1.08	2.2	4 19.7	4 8 37.8	+ 4 14.6	-0.0474	0.5650	0.1858	+32	-38
66 Virginis	6	1.09	2.2	4 34.1	9 10.5	+ 4 46.1	+0.0949	0.5650	0.1857	+40	-30
l^1 Virginis	6½	1.14	2.3	5 52.8	11 48.4	+ 7 18.6	+0.9415	0.5644	0.1841	+84	+19
l^2 Virginis	5	+1.15	- 2.2	- 5 40.1	12 30.3	+ 7 59.0	+0.5991	0.5643	-0.1835	+75	- 2
80 Virginis	6	1.16	1.8	4 48.9	14 6.2	+ 9 31.7	-0.5641	0.5641	0.1827	+ 3	-73
88 Virginis	6½	1.25	1.6	6 16.1	19 50.8	- 8 55.6	-0.1177	0.5630	0.1786	+27	-42
B.A.C.4647 *mult.*	6½	1.31	1.6	7 29.9	22 51.2	- 6 1.3	+0.6080	0.5622	0.1764	+75	- 1
94 Virginis	6½	1.38	1.3	8 20.9	5 3 57.4	- 1 5.5	+0.5928	0.5616	0.1724	+73	- 2
95 Virginis	6	+1.39	- 1.4	- 8 46.2	4 9.0	- 0 54.3	+0.9922	0.5616	-0.1724	+82	+23
ξ^1 Libræ	6	1.69	+ 0.1	11 26.0	6 1 46.5	- 4 0.8	+0.2535	0.5599	0.1508	+45	-21
ξ^2 Libræ	5½	1.71	0.4	10 57.0	2 52.0	- 2 57.5	-0.4153	0.5598	0.1495	+ 8	-61
18 Libræ	6	1.71	0.6	10 41.2	3 50.8	- 2 0.7	-0.8364	0.5598	0.1485	-17	-90
B. A. C. 5070	6	1.87	1.7	11 57.7	15 13.5	+ 8 59.0	-1.1200	0.5591	0.1348	-40	-90
γ Libræ	4½	+1.96	+ 1.6	-14 24.5	20 30.1	- 9 55.1	+0.7599	0.5590	-0.1275	+76	+ 8
η Libræ	6	2.04	1.8	15 18.5	7 0 23.7	- 6 9.4	+1.2243	0.5590	0.1221	+75	+48
48 Libræ	5½	2.08	3.0	13 57.0	6 52.4	+ 0 6.3	-0.9763	0.5590	0.1133	-30	-90
W.(²) xvi. 140	6½	2.19	4.0	14 33.7	14 56.6	+ 7 54.1	-1.1984	0.5589	0.1018	-52	-90
ϕ Ophiuchi	4½	2.30	4.5	16 21.8	21 54.3	- 9 22.2	+0.0480	0.5589	0.0913	+27	-32
24 Scorpii	5½	+2.36	+ 4.8	-17 31.2	8 2 39.4	- 4 46.6	+0.8706	0.5589	-0.0836	+73	+16
B. A. C. 6294	5½	2.80	11.6	18 28.6	10 5 15.9	- 3 51.6	-0.2475	0.5558	-0.0007	+ 2	-50
Lalande 35497	6½	2.90	13.1	19 24.4	20 2.4	+10 25.7	+0.9471	0.5535	+0.0240	+71	+22
B. A. C. 6536	6	2.92	13.4	19 27.8	22 29.5	-11 12.0	+1.0757	0.5529	0.0284	+71	+33
d Sagittarii	5	2.93	14.0	19 9.1	11 2 55.1	- 6 55.1	+0.8740	0.5521	0.0350	+71	+17
ρ^1 Sagittarii	4	+2.92	+14.4	-18 3.5	4 51.2	- 5 2.8	-0.2566	0.5518	+0.0381	+ 5	-51
ρ^2 Sagittarii	6½	2.92	14.4	18 31.0	4 55.2	- 4 58.9	+0.2493	0.5518	0.0383	+34	-21
B. A. C. 6707	6½	2.95	14.9	19 6.0	11 50.6	+ 1 43.1	+1.1934	0.5516	0.0492	+71	+46
B. A. C. 6710	6	2.95	15.1	18 28.8	12 9.2	+ 2 1.0	+0.5268	0.5516	0.0494	+54	- 5
B. A. C. 7063	6½	2.96	18.0	15 25.9	12 14 20.1	+ 3 22.0	-1.0316	0.5437	0.0875	-37	-90
τ^1 Capricorni	6½	+2.96	+18.1	-15 32.2	17 22.7	+ 6 18.9	-0.6424	0.5428	+0.0916	-11	-84
τ^2 Capricorni	5½	+2.96	+18.2	-15 21.0	18 19.6	+ 7 14.0	-0.7607	0.5425	+0.0929	-18	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0.		Apparent Declination	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
Lalande 40552	6	+2.95	+18.9	-14 55.1	13 3 56.7	- 7 26.8	-0.2828	0.5395	+0.1053	+11	-52
18 Aquarii	5½	2.91	19.6	13 21.7	16 42.8	+ 4 55.8	-0.5682	0.5359	0.1205	- 3	-74
λ Capricorni	5½	2.89	20.0	11 53.2	14 4 4.0	- 8 3.6	-0.7723	0.5327	0.1320	-14	-90
e² Aquarii	5½	2.85	20.2	12 7.2	16 25.6	+ 3 55.8	+1.1932	0.5296	0.1438	+78	+42
B. A. C. 7774	6½	2.84	20.2	9 36.2	19 41.3	+ 7 5.8	-1.1321	0.5285	0.1464	-38	-90
λ Aquarii	4	+2.76	+19.8	- 8 10.9	15 14 20.1	+ 1 11.9	+0.1463	0.5248	+0.1595	+41	-27
78 Aquarii	6½	2.76	19.7	7 48.3	15 22.0	+ 2 12.0	-0.1092	0.5246	0.1601	+27	-41
81 Aquarii	6½	2.74	19.7	7 40.1	18 57.4	+ 5 41.2	+0.3185	0.5240	0.1622	+52	-17
82 Aquarii	6½	2.74	19.7	7 10.9	19 33.8	+ 6 16.5	-0.1222	0.5237	0.1628	+26	-42
φ Aquarii	4	2.71	19.4	6 39.5	16 1 46.6	-11 41.6	+0.3164	0.5229	0.1659	+52	-17
96 Aquarii	5½	+2.69	+19.3	- 5 44.6	4 27.2	- 9 5.5	-0.2534	0.5224	+0.1672	+20	-50
B. A. C. 8184	6	2.67	19.0	5 9.0	9 49.4	- 3 52.6	-0.0092	0.5218	0.1693	+33	-35
20 Piscium	5½	2.63	18.3	3 23.4	19 35.7	+ 5 36.9	-0.2863	0.5212	0.1727	+19	-52
24 Piscium	6	2.62	18.2	3 47.0	22 14.6	+ 8 11.2	+0.6073	0.5212	0.1734	+76	- 2
29 Piscium	5	2.59	17.9	3 39.4	17 2 58.3	-11 13.2	+1.2874	0.5207	0.1745	+87	+52
4 Ceti	6	+2.58	+17.6	- 3 10.7	6 6.5	- 8 10.4	+1.3053	0.5208	+0.1750	+87	+56
5 Ceti	6	2.58	17.6	3 4.7	6 21.6	- 7 55.7	+1.2385	0.5208	0.1751	+87	+45
B. A. C. 5	5½	2.57	17.5	2 51.2	6 37.8	- 7 40.0	+1.0378	0.5210	0.1751	+87	+26
10 Ceti	6	2.54	16.4	- 0 40.5	16 7.1	+ 1 33.0	+0.2962	0.5210	0.1761	+52	-19
B. A. C. 237	6½	2.48	14.7	+ 2 46.2	18 5 8.4	- 9 48.3	-1.2050	0.5225	0.1759	-41	-88
f Piscium	5	+2.38	+13.2	+ 3 1.1	19 0.5	+ 3 39.6	+0.9480	0.5248	+0.1736	+90	+20
μ Piscium	5	2.37	12.0	5 33.5	19 1 23.3	+ 9 51.2	-0.7328	0.5266	0.1715	- 6	-84
ν Piscium	4½	2.33	11.5	4 54.9	7 12.6	- 8 29.8	+0.9621	0.5280	0.1695	+90	+22
64 Ceti	5½	2.24	8.9	8 2.3	22 23.1	+ 6 13.3	+0.0778	0.5338	0.1618	+39	-28
ξ¹ Ceti	4	2.24	8.6	8 18.8	23 12.3	+ 7 1.1	-0.0886	0.5338	0.1614	+30	-33
ξ Arietis	5	+2.21	+ 7.4	+10 5.7	20 5 4.9	-11 17.1	-1.0782	0.5362	+0.1578	-31	-80
B. A. C. 755	6½	2.20	7.3	10 3.2	6 2.9	-10 21.0	-0.8812	0.5365	0.1569	-15	-80
85 Ceti	6	2.13	6.4	10 15.4	13 47.8	- 2 50.5	+0.0951	0.5403	0.1512	+40	-26
μ Ceti	4	2.10	6.4	9 38.1	14 59.4	- 1 41.1	+0.9458	0.5406	0.1502	+90	+23
Lalande 5725	6	2.06	4.2	12 45.2	21 1 20.3	+ 8 20.1	-0.8976	0.5458	0.1412	-17	-78
f Tauri	4	+1.94	+ 2.7	+12 32.7	12 55.3	- 4 27.4	+0.8919	0.5523	+0.1291	+90	+22
48 Tauri	6	1.75	- 0.7	15 7.0	22 9 24.1	- 8 39.9	+0.5500	0.5652	0.1027	+73	+ 5
γ Tauri	4	1.74	1.0	15 21.2	11 11.5	- 6 56.2	+0.4830	0.5658	0.1006	+67	+ 1
58 Tauri	6	1.72	0.9	14 49.3	11 33.8	- 6 34.8	+1.0775	0.5667	0.0997	+90	+40
63 Tauri	6	1.74	1.6	16 30.6	12 46.9	- 5 24.2	-0.5750	0.5669	0.0981	+ 2	-62
70 Tauri	6	+1.71	- 1.5	+15 40.8	13 46.4	- 4 26.7	+0.3930	0.5678	+0.0966	+60	- 3
71 Tauri	6	1.70	1.4	15 21.6	14 6.1	- 4 7.7	+0.7596	0.5679	0.0964	+90	+18
75 Tauri	6	1.70	1.7	16 6.3	15 1.1	- 3 14.6	+0.0663	0.5686	0.0950	+39	-21
θ¹ Tauri	4	1.69	1.6	15 42.6	15 4.8	- 3 11.1	+0.4871	0.5686	0.0950	+68	+ 2
θ² Tauri	4	1.69	1.6	15 37.1	15 7.3	- 3 8.7	+0.5864	0.5686	0.0948	+77	+ 8
80 Tauri	6	+1.67	- 1.7	+15 23.3	15 46.8	- 2 30.6	+0.8898	0.5692	+0.0937	+90	+26
B. A. C. 1391	5	1.68	1.9	15 56.8	15 57.2	- 2 20.5	+0.3210	0.5693	0.0935	+55	- 7
81 Tauri	6	1.67	1.7	15 26.7	16 0.1	- 2 17.7	+0.8496	0.5693	0.0935	+90	+23
85 Tauri	6½	1.67	1.8	15 36.4	16 31.9	- 1 47.0	+0.7306	0.5697	0.0922	+90	+16
α Tauri	1	1.66	2.2	16 16.8	18 18.3	- 0 4.4	+0.1864	0.5706	0.0900	+46	-14
σ¹ Tauri	5	+1.62	- 2.2	+15 34.5	19 44.1	+ 1 18.4	+1.0510	0.5715	+0.0896	+90	+39
σ² Tauri	5	1.62	2.3	15 41.5	19 46.9	+ 1 21.1	+0.9326	0.5715	0.0875	+90	+30
B. A. C. 1526	5	1.54	3.5	16 58.4	23 3 36.4	+ 8 53.8	+0.2302	0.5765	0.0746	+49	-10
m Tauri	5	1.51	4.5	18 29.4	7 51.5	-11 0.3	-1.0392	0.5793	0.0675	-31	-72
111 Tauri	5½	1.40	4.7	17 16.5	15 5.0	- 4 2.7	+0.6582	0.5833	0.0548	+87	+16
115 Tauri	6	+1.39	- 5.1	+17 51.8	16 14.1	- 2 56.1	+0.1133	0.5838	+0.0531	+42	-14
117 Tauri	6	1.38	4.9	17 8.6	16 36.5	- 2 34.5	+0.8738	0.5845	0.0517	+90	+30
119 Tauri	5	1.37	5.5	18 30.4	18 20.1	- 0 54.8	-0.4423	0.5849	0.0490	+ 5	-47
B. A. C. 1728	6	1.35	5.0	16 58.2	18 22.5	- 0 52.5	+1.1400	0.5856	0.0482	+90	+51
120 Tauri	6	1.36	5.6	18 27.4	18 53.0	- 0 23.2	-0.3634	0.5857	0.0476	+14	-42
122 Tauri	6	+1.33	- 5.1	+16 58.0	20 22.8	+ 1 3.3	+1.2362	0.5866	+0.0445	+90	+63
127 Tauri	6	+1.34	- 6.0	+18 55.3	22 45.9	+ 3 21.1	-0.6683	0.5878	+0.0403	- 4	-66

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
130 Tauri	6	+1.29	- 5.7	+17 41.1	24 0 40.1	+ 5 11.1	+0.6725	0.5888	+0.0365	+89	+19
χ^3 Orionis	6	1.23	7.0	19 41.5	7 12.1	+11 28.2	-1.1798	0.5921	0.0241	-45	-71
71 Orionis	6	1.16	7.1	19 11.5	11 51.1	- 8 3.5	-0.5797	0.5947	+0.0144	+ 2	-55
26 Geminorum	5½	1.00	7.5	17 45.3	22 57.4	+ 2 37.0	+0.9103	0.5994	-0.0084	+90	+36
W. vii., 685	6	0.78	8.4	17 19.7	25 18 30.0	- 2 36.6	+0.7554	0.6053	0.0503	+90	+23
f Geminorum	6	+0.74	- 8.6	+17 56.0	21 30.0	+ 0 16.2	-0.0083	0.6057	-0.0567	+34	-21
g Geminorum	5	0.72	8.8	18 47.2	26 0 5.7	+ 2 45.7	-1.0120	0.6061	0.0617	-27	-72
3 Cancri	6	0.65	8.7	17 37.1	5 50.9	+ 8 17.0	-0.2365	0.6064	0.0738	+21	-36
5 Cancri	6	0.65	8.5	16 46.1	6 8.5	+ 8 33.9	+0.5853	0.6064	0.0742	+77	+10
ζ^1 Cancri	4½	0.62	8.8	17 59.3	10 18.2	-11 26.4	-0.9521	0.6068	0.0825	-22	-72
d^2 Cancri	6	+0.57	- 8.7	+17 25.2	15 38.8	- 6 18.6	-0.8612	0.6070	-0.0939	-16	-73
54 Cancri	6	0.48	8.2	15 46.2	27 1 31.3	+ 3 10.3	-0.2526	0.6064	0.1128	+21	-40
o^1 Cancri	5½	0.46	8.1	15 45.5	3 57.2	+ 5 30.4	-0.5180	0.6064	0.1170	+ 6	-59
o^2 Cancri	6	0.46	8.1	16 1.0	4 4.9	+ 5 37.8	-0.7885	0.6063	0.1170	-10	-74
Mercury				13 53.1	16 8.9	- 6 47.0	-0.2360	0.5912	0.1465	+22	-42
				NEW	*MOON.*						
10 Virginis	6½	+0.50	- 2.9	+ 2 32.3	30 10 2.0	+ 8 35.0	-0.6916	0.5841	-0.1963	- 3	-86
13 Virginis	6	0.56	3.0	- 0 9.3	13 49.7	-11 45.6	+1.2193	0.5828	0.1966	+90	+43
η Virginis	4	0.56	2.9	0 2.0	14 21.4	-11 15.1	+0.9956	0.5825	0.1965	+90	+23
γ Virginis	3	+0.62	- 2.1	- 0 49.5	23 38.2	- 2 18.6	-0.0397	0.5797	-0.1956	+33	-37
38 Virginis	6	0.65	1.8	2 56.0	31 4 32.9	+ 2 25.5	+1.0952	0.5785	0.1945	+87	+31
k Virginis	6	0.70	1.8	3 11.9	7 19.0	+ 5 5.6	+0.8228	0.5778	0.1937	+87	+11
46 Virginis	6	0.69	1.7	2 45.3	7 43.3	+ 5 29.1	+0.3020	0.5777	0.1934	+53	-18
48 Virginis	6½	0.70	1.6	3 3.0	9 8.8	+ 6 51.5	+0.3222	0.5775	0.1930	+54	-17
65 Virginis	6	+0.78	- 1.0	- 4 19.7	17 31.3	- 9 4.0	0.0000	0.5753	-0.1889	+34	-35
66 Virginis	6	0.79	1.0	4 34.1	18 2.9	- 8 33.5	+0.1402	0.5753	0.1888	+43	-28
l^1 Virginis	6½	0.83	1.1	5 52.8	20 35.6	- 6 6.3	+0.9761	0.5748	0.1871	+84	+21
l^2 Virginis	5	0.84	0.9	5 40.1	21 16.3	- 5 27.1	+0.6371	0.5746	0.1867	+78	0
80 Virginis	6	+0.84	- 0.5	- 4 48.9	22 49.1	- 3 57.5	-0.5054	0.5741	-0.1858	+ 6	-68
					SEPTEMBER.						
88 Virginis	6½	+0.91	- 0.3	- 6 16.1	1 4 22.5	+ 1 24.0	-0.0655	0.5731	-0.1816	+30	-39
B.A.C.4647 *mult.*	6½	0.96	0.3	7 29.9	7 17.2	+ 4 12.5	+0.6494	0.5725	0.1797	+78	+ 1
94 Virginis	6½	+1.01	0.0	- 8 20.9	12 13.5	+ 8 58.3	+0.6330	0.5718	-0.1756	+76	0
95 Virginis	6	1.02	- 0.1	8 46.2	12 24.7	+ 9 9.2	+1.0280	0.5715	0.1749	+82	+26
ξ^1 Libræ	6	1.28	+ 1.5	11 26.0	2 9 22.4	+ 5 22.8	+0.3012	0.5682	0.1529	+48	-18
ξ^2 Libræ	5½	1.29	1.9	10 57.0	10 26.0	+ 6 24.2	-0.3579	0.5680	0.1516	+11	-57
18 Libræ	6	1.29	2.1	10 41.2	11 23.0	+ 7 19.2	-0.7729	0.5679	0.1503	-13	-90
B. A. C. 5070	6	+1.44	+ 2.9	-11 57.7	22 26.8	- 6 0.1	-1.0537	0.5669	-0.1362	-34	-90
γ Libræ	4½	1.53	2.7	14 24.5	3 3 35.3	- 1 2.3	+0.8023	0.5663	0.1293	+76	+11
η Libræ	6	1.59	2.7	15 18.5	7 23.3	+ 2 37.9	+1.2595	0.5658	0.1237	+75	+53
48 Libræ	5½	1.64	4.2	13 56.9	13 42.8	+ 8 44.3	-0.9156	0.5649	0.1147	-26	-90
W.(*) xvi. 140	6½	1.74	4.7	14 33.7	21 36.6	- 7 38.3	-1.1363	0.5644	0.1026	-45	-90
ϕ Ophiuchi	4½	+1.86	+ 5.1	-16 21.8	4 4 26.3	- 1 2.6	+0.0934	0.5635	-0.0919	+30	-30
24 Scorpii	5½	1.92	5.3	17 31.2	9 6.4	+ 3 27.8	+0.9061	0.5632	0.0848	+73	+19
B. A. C. 6294	5½	2.45	11.3	18 28.6	6 11 13.4	+ 3 53.3	-0.2121	0.5555	-0.0009	+ 4	-48
Lalande 35497	6½	2.60	12.8	19 24.4	7 1 58.1	- 5 51.1	+0.9738	0.5525	+0.0235	+71	+24
B. A. C. 6536	6	2.63	13.0	19 27.9	4 25.2	- 3 28.8	+1.1023	0.5517	0.0279	+71	+36
d Sagittarii	5	+2.64	+13.4	-19 9.1	8 50.8	+ 0 48.1	+0.8993	0.5508	+0.0347	+71	+19
ρ^1 Sagittarii	4	2.64	13.9	18 3.5	10 47.1	+ 2 40.6	-0.2305	0.5502	0.0379	+ 7	-49
ρ^2 Sagittarii	6½	2.64	13.8	18 31.0	10 51.0	+ 2 44.4	+0.2762	0.5502	0.0381	+35	-19
B. A. C. 6707	6½	2.70	14.2	19 6.0	17 46.9	+ 9 26.9	+1.2190	0.5486	0.0484	+71	+50
B. A. C. 6710	6	2.70	14.6	18 28.9	18 5.6	+ 9 44.9	+0.5537	0.5486	0.0491	+56	- 3
B. A. C. 7063	6½	+2.83	+17.7	-15 25.9	8 20 20.6	+11 9.9	-1.0104	0.5418	+0.0870	-36	-90
τ^1 Capricorni	6½	+2.84	+17.8	-15 32.2	23 23.5	- 9 52.9	-0.6210	0.5406	+0.0917	-10	-81

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
τ^2 Capricorni	5½	+2.85	+18.0	−15 21.0	9 0 20.8	− 8 57.4	−0.7418	0.5406	+0.0923	−17	−90
Lalande 40522	6	2.88	18.7	14 55.1	9 59.6	+ 0 23.5	−0.2680	0.5382	0.1048	+11	−51
9 Aquarii	6½	2.87	19.0	13 58.3	11 13.1	+ 1 34.7	−1.1888	0.5376	0.1063	−50	−90
18 Aquarii	5½	2.91	19.6	13 21.7	22 47.7	−11 11.9	−0.5534	0.5348	0.1199	− 3	−73
λ Capricorni	5½	2.93	20.2	11 53.2	10 10 10.2	− 0 9.9	−0.7591	0.5319	0.1318	−13	−90
ϵ^2 Aquarii	5½	+2.95	+20.5	−12 7.2	22 32.3	+11 50.0	+1.2039	0.5289	+0.1435	+78	+43
B. A. C. 7774	6½	2.95	20.8	9 36.2	11 1 48.2	− 8 59.9	−1.1205	0.5289	0.1461	−37	−90
λ Aquarii	4	2.95	20.9	8 10.9	20 25.7	+ 9 4.9	+0.1574	0.5266	0.1600	+42	−26
78 Aquarii	6½	2.96	20.9	7 48.3	21 27.4	+10 4.8	−0.0981	0.5253	0.1607	+27	−41
81 Aquarii	6½	2.96	20.9	7 39.9	12 1 2.5	−10 26.3	+0.3256	0.5249	0.1627	+52	−17
82 Aquarii	6½	+2.96	+20.8	− 7 10.9	1 38.8	− 9 51.1	−0.1129	0.5248	+0.1630	+26	−42
φ Aquarii	4	2.96	20.7	6 39.5	7 50.7	− 3 50.0	+0.3273	0.5241	0.1662	+53	−17
96 Aquarii	5½	2.96	20.6	5 44.6	10 30.7	− 1 14.5	−0.2422	0.5238	0.1677	+20	−49
B. A. C. 8184	6	2.96	20.4	5 9.0	15 51.8	+ 3 57.2	+0.0018	0.5230	0.1698	+34	−35
20 Piscium	5½	2.96	19.9	3 23.4	13 1 35.9	−10 35.5	−0.2750	0.5230	0.1735	+19	−51
24 Piscium	6	+2.96	+19.8	− 3 47.0	4 14.0	− 8 2.0	+0.6180	0.5230	+0.1738	+76	− 1
29 Piscium	5	2.94	19.6	3 39.4	8 56.5	− 3 27.6	+1.2996	0.5230	0.1753	+87	+55
4 Ceti	6	2.94	19.4	3 10.7	12 3.8	− 0 25.7	+1.3173	0.5228	0.1758	+87	+58
5 Ceti	6	2.94	19.4	3 4.7	12 18.8	− 0 11.1	+1.2508	0.5228	0.1760	+87	+47
B. A. C. 5	5½	2.94	19.4	2 51.2	12 34.9	+ 0 4.5	+1.0500	0.5231	0.1760	+87	+27
10^e Ceti	6	+2.94	+18.6	− 0 40.5	22 1.7	+ 9 15.0	+0.3108	0.5232	+0.1771	+54	−18
B. A. C. 237	6½	2.95	17.3	+ 2 46.3	14 10 59.5	− 2 9.8	−1.1904	0.5247	0.1768	−40	−88
f Piscium	5	2.91	16.0	3 1.2	15 0 48.4	+11 14.9	+0.9654	0.5272	0.1744	+90	+22
μ Piscium	5	2.92	15.1	5 33.6	7 10.3	− 6 34.5	−0.7153	0.5283	0.1725	− 5	−85
ν Piscium	4½	2.89	14.6	4 54.9	12 58.8	− 0 56.2	+0.9856	0.5301	0.1702	+90	+24
64 Ceti	5½	+2.86	+12.0	+ 8 2.4	16 4 9.4	−10 13.1	+0.1015	0.5342	+0.1625	+41	−27
ξ^1 Ceti	4	2.86	11.8	8 18.9	4 58.4	− 9 25.5	−0.0653	0.5345	0.1619	+31	−36
ξ Arietis	5	2.86	10.7	10 5.8	10 51.8	− 3 43.0	−1.0583	0.5366	0.1580	−29	−80
B. A. C. 755	6½	2.85	10.6	10 3.3	11 49.9	− 2 46.6	−0.8610	0.5371	0.1572	−14	−80
85 Ceti	6	2.81	9.6	10 15.5	19 36.8	+ 4 45.9	+0.1226	0.5403	0.1513	+42	−24
μ Ceti	4	+2.78	+ 9.4	+ 9 38.2	20 48.7	+ 5 55.6	+0.9752	0.5405	+0.1504	+90	+26
Lalande 5725	6	2.77	7.1	12 45.2	17 7 13.7	− 7 59.1	−0.8708	0.5446	0.1411	−15	−77
f Tauri	4	2.67	5.4	12 32.8	18 55.8	+ 3 20.6	+0.9309	0.5500	0.1288	+90	+25
48 Tauri	6	2.53	1.7	15 7.0	18 15 43.1	− 0 33.5	+0.5911	0.5605	0.1023	+77	+ 7
γ Tauri	4	2.52	1.3	15 21.2	17 32.5	+ 1 12.2	+0.5232	0.5616	0.0995	+71	+ 4
58 Tauri	6	+2.51	+ 1.4	+14 49.3	17 55.2	+ 1 34.1	+1.1241	0.5616	+0.0993	+90	+44
63 Tauri	6	2.52	0.6	16 30.6	19 9.8	+ 2 46.2	−0.5423	0.5617	0.0977	+ 4	−60
δ^3 Tauri	5½	2.53	0.3	17 10.8	19 27.3	+ 3 3.0	−1.2241	0.5623	0.0966	−49	−73
70 Tauri	6	2.49	0.7	15 40.8	20 10.5	+ 3 44.8	+0.4343	0.5623	0.0962	+63	− 1
71 Tauri	6	2.49	0.8	15 21.6	20 30.5	+ 4 4.1	+0.8048	0.5629	0.0953	+90	+21
75 Tauri	6	+2.49	+ 0.4	+16 6.3	21 26.6	+ 4 58.3	+0.1058	0.5634	+0.0939	+41	−19
θ^1 Tauri	4	2.48	0.5	15 42.6	21 30.4	+ 5 2.0	+0.5293	0.5633	0.0939	+71	+ 5
θ^2 Tauri	4	2.48	0.5	15 37.1	21 32.9	+ 5 4.4	+0.6298	0.5633	0.0939	+82	+10
80 Tauri	6	2.46	0.5	15 23.3	22 13.3	+ 5 43.4	+0.9363	0.5635	0.0931	+90	+30
B. A. C. 1391	5	2.47	0.3	15 56.8	22 23.7	+ 5 53.4	+0.3615	0.5639	0.0924	+58	− 5
81 Tauri	6	+2.46	+ 0.5	+15 26.7	22 26.7	+ 5 56.3	+0.8958	0.5639	+0.0924	+90	+27
85 Tauri	6½	2.47	+ 0.4	15 36.4	22 59.4	+ 6 27.9	+0.7757	0.5639	0.0919	+90	+19
α Tauri	1	2.46	− 0.1	16 16.8	19 0 47.9	+ 8 12.8	+0.2272	0.5646	0.0889	+48	−11
σ^1 Tauri	5	2.43	0.0	15 34.5	2 15.6	+ 9 37.4	+1.1003	0.5656	0.0872	+90	+43
σ^2 Tauri	5	2.43	0.1	15 41.5	2 18.5	+ 9 40.2	+0.9806	0.5656	0.0872	+90	+34
B. A. C. 1526	5	+2.35	− 1.8	+16 58.5	10 19.0	− 6 36.0	+0.2700	0.5697	+0.0743	+51	− 8
m Tauri	5	2.32	2.9	18 29.5	14 40.2	− 2 24.0	−1.0144	0.5720	0.0666	−28	−72
111 Tauri	5½	2.21	3.5	17 16.5	22 5.2	+ 4 45.2	+0.7071	0.5753	0.0543	+90	+19
115 Tauri	6	2.20	4.0	17 51.8	23 16.3	+ 5 53.7	+0.1549	0.5757	0.0522	+44	−12
117 Tauri	6	2.18	3.8	17 8.6	23 39.3	+ 6 15.9	+0.9274	0.5759	0.0512	+90	+34
119 Tauri	5	+2.18	− 4.5	+18 30.4	20 1 25.7	+ 7 58.4	−0.4085	0.5772	+0.0478	+12	−45
B. A. C. 1728	6	+2.16	− 4.0	+16 58.2	1 28.3	+ 8 0.9	+1.1959	0.5772	+0.0478	+90	+57

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0. Δα	Red'ns from 1886.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
120 Tauri	6	+2.17	− 4.6	+18 27.4	20 1 59.6	+ 8 31.1	−0.3285	0.5772	+0.0473	+16	−39
127 Tauri	6	2.14	5.1	18 55.3	5 59.4	−11 37.8	−0.6382	0.5790	0.0399	− 2	−63
130 Tauri	6	2.09	5.0	17 41.1	7 57.0	− 9 44.5	+0.7223	0.5799	0.0362	+90	+22
χ^3 Orionis	6	2.04	6.5	19 41.5	14 40.9	− 3 15.3	−1.1561	0.5826	0.0235	−42	−71
68 Orionis	6	1.99	7.0	19 48.8	18 16.8	+ 0 12.5	−1.2089	0.5843	0.0169	−49	−71
71 Orionis	6	+1.96	− 6.8	+19 11.5	19 28.8	+ 1 21.8	−0.5474	0.5848	+0.0141	+ 4	−52
26 Geminorum	5½	1.77	7.6	17 45.3	21 6 57.3	−11 35.3	+0.9642	0.5885	−0.0080	+90	+40
W. vii. 685	6	1.47	9.1	17 19.6	22 3 10.7	+ 7 51.9	+0.8081	0.5939	0.0490	+90	+26
f Geminorum	6	1.43	9.6	17 55.9	6 16.9	+10 51.0	+0.0304	0.5946	0.0552	+37	−19
g Geminorum	5	1.40	10.0	18 47.1	8 58.0	−10 34.1	−0.9874	0.5950	0.0608	−25	−72
3 Cancri	6	+1.31	−10.0	+17 37.0	14 55.1	− 4 50.8	−0.2032	0.5958	−0.0726	+23	−34
5 Cancri	6	1.30	9.7	16 46.0	15 13.3	− 4 33.3	+0.6299	0.5958	0.0748	+82	+13
ζ^1 Cancri	4½	1.24	10.2	17 59.2	19 31.3	− 0 25.3	−0.9303	0.5964	0.0818	−21	−72
d^2 Cancri	6	1.18	10.2	17 25.1	23 1 2.7	+ 4 53.3	−0.8373	0.5965	0.0921	−14	−73
54 Cancri	6	1.03	9.7	15 46.2	11 13.9	− 9 19.1	−0.2246	0.5965	0.1109	+22	−39
o^1 Cancri	5½	+1.01	− 9.8	+15 45.4	13 44.2	− 6 54.6	−0.4934	0.5965	−0.1156	+ 7	−57
o^2 Cancri	6	1.01	9.9	16 0.9	13 52.1	− 6 47.0	−0.7660	0.5965	0.1158	− 9	−74
π^1 Cancri	6	0.93	9.6	15 27.1	19 51.1	− 1 1.9	−0.9264	0.5962	0.1261	−20	−75
π^2 Cancri	6	0.91	9.5	15 24.6	21 0.9	+ 0 5.2	−1.0335	0.5962	0.1278	−28	−75
18 Leonis	6	0.79	8.7	12 20.1	24 9 41.1	−11 43.8	+0.2672	0.5952	0.1479	+51	−15
ν Leonis	5	+0.73	− 8.6	+12 59.3	14 29.6	− 7 6.3	−1.1051	0.5944	−0.1548	−33	−77
A Leonis	4½	0.71	8.0	10 33.3	18 28.1	− 3 16.9	+0.6728	0.5939	0.1601	+86	+ 7
44 Leonis	6	0.66	7.5	9 21.7	25 1 34.2	+ 3 32.9	+0.6816	0.5928	0.1687	+87	+ 6
45 Leonis	6	0.65	7.6	10 20.5	2 32.7	+ 4 29.3	−0.4482	0.5925	0.1698	+10	−59
ρ Leonis	4	0.63	7.4	9 53.5	4 40.0	+ 6 31.7	−0.3661	0.5924	0.1722	+15	−54
49 Leonis	6	+0.63	− 7.3	+ 9 14.3	5 35.2	+ 7 24.8	+0.1165	0.5923	−0.1732	+42	−25
VENUS				+ 6 37.8	23 25.0	+ 0 34.3	−0.5531	0.5429	0.1698	+ 4	−70
				NEW	*MOON.*						
94 Virginis	6½	0.78	+ 0.6	− 8 20.9	28 22 25.4	− 3 1.6	+0.5765	0.5794	0.1781	+71	− 3
95 Virginis	6	+0.78	+ 0.6	− 8 46.2	22 36.4	− 2 50.9	+0.9659	0.5794	−0.1781	+82	+21
ξ^1 Libræ	6	0.94	2.4	11 26.0	29 19 1.7	− 7 9.8	+0.2333	0.5775	0.1562	+44	−22
ξ^2 Libræ	5½	0.94	2.6	10 57.0	20 3.5	− 6 10.3	−0.4178	0.5772	0.1550	+ 8	−61
18 Libræ	6	0.95	2.8	10 41.2	20 59.1	− 5 16.6	−0.8279	0.5771	0.1538	−16	−90
B.A.C. 5070	6	1.06	3.7	11 57.6	30 7 43.8	+ 5 4.9	−1.1133	0.5761	0.1393	−39	−90
γ Libræ	4½	+1.13	+ 3.7	−14 24.4	12 43.2	+ 9 53.5	+0.7148	0.5754	−0.1320	+76	+ 6
η Libræ	6	1.17	3.8	15 18.4	16 24.5	−10 33.1	+1.1641	0.5750	0.1264	+75	+40
48 Libræ	5½	+1.22	+ 5.0	−13 56.9	22 33.0	− 4 37.7	−0.9847	0.5742	−0.1168	−31	−90

OCTOBER.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
ϕ Ophiuchi	4½	+1.37	+ 5.8	−16 21.8	1 12 50.9	+ 9 9.9	+0.0070	0.5724	−0.0939	+25	−35
24 Scorpii	5½	1.43	5.8	17 31.2	17 23.1	−10 27.6	+0.8091	0.5716	0.0860	+73	+12
B. A. C. 6294	5½	1.96	11.0	18 28.6	3 18 20.8	−11 11.6	−0.3109	0.5602	−0.0011	− 2	−54
Lalande 35497	6½	2.12	12.0	19 24.4	4 8 52.0	+ 2 50.3	+0.8668	0.5551	+0.0239	+71	+16
B. A. C. 6536	6	+2.15	+12.3	−19 27.9	11 17.3	+ 5 10.8	+0.9926	0.5546	+0.0275	+71	+26
d Sagittarii	5	2.18	12.6	19 9.1	15 39.6	+ 9 24.4	+0.7914	0.5531	0.0352	+71	+11
ρ^1 Sagittarii	4	2.20	13.1	18 3.5	17 34.5	+11 15.5	−0.3288	0.5524	0.0383	+ 1	−56
ρ^2 Sagittarii	6½	2.20	13.0	18 31.0	17 38.4	+11 19.3	+0.1726	0.5524	0.0383	+29	−25
B. A. C. 6707	6½	2.27	13.3	19 6.0	5 0 30.1	− 6 2.4	+1.1112	0.5500	0.0494	+71	+36
B. A. C. 6710	6	+2.26	+13.6	−18 28.9	0 48.6	− 5 44.5	+0.4519	0.5500	+0.0496	+48	− 9
B. A. C. 7063	6½	2.46	16.8	15 25.9	6 2 53.7	− 4 29.5	−1.0988	0.5514	0.0876	−43	−90
τ^1 Capricorni	6½	2.49	16.8	15 32.2	5 56.2	− 1 32.7	−0.7115	0.5403	0.0916	−15	−90
τ^2 Capricorni	5½	2.50	16.9	15 21.0	6 53.2	− 0 37.4	−0.8312	0.5398	0.0927	−22	−90
Lalande 40552	6	2.56	17.5	14 55.1	16 30.8	+ 8 42.3	−0.3538	0.5367	0.1053	+ 7	−57
18 Aquarii	5½	+2.62	+18.5	−13 21.7	7 5 18.6	− 2 53.5	−0.6331	0.5332	+0.1200	− 7	−82
λ Capricorni	5½	+2.69	+19.3	−11 53.2	16 41.3	+ 8 8.7	−0.8318	0.5305	+0.1323	−18	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0. Δα	Red'ns from 1886.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
σ^2 Aquarii	5½	+2.77	+19.4	-12 7.2	8 5 4.4	- 3 50.3	+1.1371	0.5277	+0.1436	+78	+36
B. A. C. 7774	6½	2.78	20.1	9 36.2	8 20.4	- 0 40.1	-1.1798	0.5271	0.1465	-43	-90
λ Aquarii	4	2.86	20.3	8 10.9	9 2 59.0	- 6 34.3	+0.1090	0.5242	0.1604	+39	-29
78 Aquarii	6½	2.87	20.2	7 48.3	4 0.7	- 5 34.4	-0.1422	0.5242	0.1611	+25	-43
81 Aquarii	6½	2.89	20.2	7 40.1	7 35.7	- 2 5.6	+0.2863	0.5237	0.1635	+50	-19
82 Aquarii	6½	+2.89	+20.3	- 7 10.9	8 12.1	- 1 30.3	-0.1533	0.5237	+0.1635	+25	-44
φ Aquarii	4	2.92	20.2	6 39.5	14 23.7	+ 4 30.5	+0.2916	0.5234	0.1672	+51	-19
96 Aquarii	5½	2.94	20.4	5 44.6	17 3.8	+ 7 6.0	-0.2749	0.5232	0.1683	+19	-51
B. A. C. 8184	6	2.96	20.4	5 9.0	22 24.4	-11 42.7	-0.0240	0.5231	0.1709	+33	-36
20 Piscium	5½	3.00	20.2	3 23.4	10 8 7.5	- 2 16.3	-0.2890	0.5230	0.1746	+19	-52
24 Piscium	6	+3.01	+20.0	- 3 47.0	10 45.1	+ 0 16.7	+0.6035	0.5230	+0.1754	+76	- 2
29 Piscium	5	3.02	19.9	3 39.4	15 26.7	+ 4 50.2	+1.2891	0.5236	0.1767	+87	+52
5 Ceti	6	3.03	19.7	3 4.7	18 48.3	+ 8 5.9	+1.2439	0.5236	0.1773	+87	+46
B. A. C. 5	5½	3.04	19.7	2 51.2	19 4.5	+ 8 21.7	+1.0438	0.5237	0.1773	+87	+26
10 Ceti	6	3.09	19.3	- 0 40.5	11 4 28.6	- 6 30.6	+0.3191	0.5248	0.1786	+54	-17
B. A. C. 237	6½	+3.15	+18.3	+ 2 46.3	17 21.9	+ 6 0.1	-1.1609	0.5266	+0.1786	-36	-88
f Piscium	5	3.18	16.9	3 1.2	12 7 4.5	- 4 41.6	+1.0055	0.5295	0.1765	+90	+24
μ Piscium	5	3.21	16.3	5 33.6	13 23.1	+ 1 25.7	-0.6620	0.5311	0.1746	- 2	-81
ν Piscium	4½	3.21	15.6	4 55.0	19 8.4	+ 7 0.7	+1.0368	0.5329	0.1725	+90	+27
64 Ceti	5½	3.27	13.5	8 2.4	13 10 10.3	- 2 24.7	+0.1771	0.5379	0.1648	+45	-23
ξ^1 Ceti	4	+3.27	+13.4	+ 8 18.9	10 58.8	- 1 37.7	+0.0126	0.5379	+0.1643	+36	-32
ξ Arietis	5	3.30	12.4	10 5.8	16 48.7	+ 4 1.4	-0.9718	0.5400	0.1602	-22	-80
B. A. C. 755	6½	3.29	12.3	10 3.3	17 46.2	+ 4 57.2	-0.7716	0.5407	0.1596	- 8	-80
85 Ceti	6	3.29	11.0	10 15.5	14 1 28.5	-11 35.0	+0.2158	0 5438	0.1534	+48	-19
μ Ceti	4	3.27	10.9	9 38.2	2 39.7	-10 26.0	+1.0676	0.5440	0.1524	+90	+33
Lalande 5725	6	+3.30	+ 8.9	+12 45.2	12 58.9	- 0 26.5	-0.7633	0.5483	+0.1431	- 8	-78
f Tauri	4	3.27	6.8	12 32.8	15 0 35.1	+10 47.2	+1.0474	0.5535	0.1304	+90	+34
48 Tauri	6	3.21	2.8	15 7.0	21 15.5	+ 6 46.2	+0.7278	0.5623	0.1040	+90	+15
γ Tauri	4	3.20	2.4	15 21.2	23 4.5	+ 8 31.5	+0.6617	0.5631	0.1012	+86	+11
63 Tauri	6	3.21	1.8	16 30.6	16 0 41.5	+10 5.3	-0.4051	0.5640	0.0985	+12	-49
δ^3 Tauri	5½	+3.22	+ 1.6	+17 10.8	0 59.0	+10 22.1	-1.0857	0.5640	+0.0983	-33	-73
70 Tauri	6	3.18	1.9	15 40.8	1 42.0	+11 3.6	+0.5745	0.5644	0.0972	+76	+ 7
71 Tauri	6	3.17	1.9	15 21.6	2 2.1	+11 23.1	+0.9455	0.5644	0.0967	+90	+30
75 Tauri	6	3.19	1.5	16 6.3	2 58.0	-11 43.0	+0.2474	0.5649	0.0952	+50	-11
θ^1 Tauri	4	3.18	1.6	15 42.6	3 1.8	-11 39.3	+0.6712	0.5649	0.0951	+88	+13
θ^2 Tauri	4	+3.18	+ 1.6	+15 37.1	3 4.3	-11 36.9	+0.7720	0.5649	+0.0951	+90	+19
80 Tauri	6	3.16	1.6	15 23.3	3 44.6	-10 57.9	+1.0792	0.5652	0.0940	+90	+41
B. A. C. 1391	5	3.17	1.5	15 56.8	3 55.1	-10 47.8	+0.5034	0.5652	0.0938	+69	+ 3
81 Tauri	6	3.16	1.6	15 26.7	3 58.1	-10 44.9	+1.0404	0.5652	0.0937	+90	+38
85 Tauri	6½	3.16	1.5	15 36.4	4 30.6	-10 13.5	+0.9183	0.5657	0.0927	+90	+29
α Tauri	1	+3.16	+ 0.9	+16 16.8	6 19.0	- 8 28.8	+0.3706	0.5659	+0.0903	+59	- 4
σ^1 Tauri	5	3.13	0.8	15 34.5	7 46.5	- 7 4.4	+1.2468	0.5667	0.0878	+90	+60
σ^2 Tauri	5	3.14	+ 0.7	15 41.5	7 49.5	- 7 1.5	+1.1269	0.5667	0.0878	+90	+46
B. A. C. 1526	5	3.10	- 1.0	16 58.5	15 50.1	+ 0 42.4	+0.4202	0.5701	0.0749	+62	0
m Tauri	5	3.10	2.2	18 29.5	20 12.1	+ 4 55.2	-0.8672	0.5718	0.0677	-16	-72
111 Tauri	5½	+3.00	- 3.1	+17 16.5	17 3 38.9	-11 53.8	+0.8680	0.5746	+0.0544	+90	+29
115 Tauri	6	3.00	3.5	17 51.8	4 50.4	-10 44.9	+0.3131	0.5749	0.0525	+55	- 3
117 Tauri	6	2.98	3.3	17 8.6	5 13.6	-10 22.5	+1.0897	0.5751	0.0521	+90	+46
119 Tauri	5	2.98	4.1	18 30.4	7 0.6	- 8 39.3	-0.2517	0.5755	0.0488	+21	-34
120 Tauri	6	2.97	4.2	18 27.4	7 34.8	- 8 6.3	-0.1730	0.5763	0.0474	+25	-30
127 Tauri	6	+2.94	- 5.0	+18 55.3	11 36.3	- 4 13.5	-0.4816	0.5775	+0.0401	+ 8	-49
130 Tauri	6	2.91	5.0	17 41.1	13 34.8	- 2 19.2	+0.8876	0.5781	0.0365	+90	+32
χ^2 Orionis	6	2.91	6.0	19 43.5	16 45.2	+ 0 44.3	-1.1371	0.5789	0.0307	-40	-71
χ^3 Orionis	6	2.86	6.8	19 41.5	20 22.9	+ 4 14.0	-1.0014	0.5801	0.0233	-27	-71
68 Orionis	6	2.81	7.4	19 48.8	18 0 1.5	+ 7 44.6	-1.0537	0.5808	0.0170	-31	-71
71 Orionis	6	+2.79	- 7.3	+19 11.5	1 14.5	+ 8 54.9	-0.3869	0.5811	+0.0149	+13	-40
26 Geminorum	5½	+2.58	- 8.5	+17 45.3	12 53.6	- 3 51.6	+1.1413	0.5838	-0.0081	+90	+55

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
W. vii. 685	6	+2.28	-10.8	+17 19.6	19 9 32.6	- 7 58.8	+0.9861	0.5864	-0.0490	+90	+39
f Geminorum	6	2.24	11.4	17 55.9	12 43.6	- 4 54.9	+0.1983	0.5865	0.0550	+47	- 9
g Geminorum	5	2.21	11.9	18 47.1	15 28.8	- 2 15.9	-0.8335	0.5868	0.0605	-14	-71
3 Cancri	6	2.11	12.1	17 37.0	21 35.8	+ 3 37.4	-0.0409	0.5868	0.0721	+33	-24
5 Cancri	6	2.09	11.8	16 46.0	21 54.6	+ 3 55.5	+0.8058	0.5870	0.0724	+90	+23
ζ^1 Cancri	4½	+2.04	-12.5	+17 59.2	20 2 20.2	+ 8 11.2	-0.7785	0.5868	-0.0804	-10	-72
δ^2 Cancri	6	1.95	12.7	17 25.1	8 1.6	-10 20.1	-0.6889	0.5865	0.0911	- 4	-71
54 Cancri	6	1.77	12.6	15 46.2	18 32.6	- 0 12.7	-0.0710	0.5861	0.1126	+31	-30
o^1 Cancri	5½	1.72	12.7	15 45.4	21 7.9	+ 2 16.8	-0.3460	0.5858	0.1139	+16	-47
o^2 Cancri	6	1.73	12.8	16 0.9	21 16.1	+ 2 24.7	-0.6229	0.5858	0.1141	0	-67
π^1 Cancri	6	+1.64	-12.8	+15 27.1	21 3 27.2	+ 8 21.9	-0.7914	0.5852	-0.1248	-10	-75
π^2 Cancri	6	1.63	12.8	15 24.6	4 39.5	+ 9 31.5	-0.9005	0.5852	0.1266	-18	-75
18 Leonis	6	1.43	11.9	12 20.0	17 46.4	- 1 50.7	+0.4123	0.5835	0.1460	+61	- 7
23 Leonis	6	1.40	12.3	13 35.7	19 42.8	+ 0 1.4	-1.1424	0.5834	0.1488	-37	-77
ν Leonis	5	1.36	11.9	12 59.2	22 45.2	+ 2 57.1	-0.9874	0.5831	0.1528	-23	-77
A Leonis	4½	+1.30	-11.2	+10 33.2	22 2 52.1	+ 6 54.9	+0.8139	0.5825	-0.1580	+90	+15
α Leonis	1½	1.29	11.6	12 31.4	3 3.5	+ 7 5.9	-1.1899	0.5825	0.1581	-41	-78
44 Leonis	6	1.23	10.7	9 21.6	10 13.2	-10 0.2	+0.8141	0.5817	0.1665	+90	+14
45 Leonis	6	1.21	10.8	10 20.4	11 13.8	- 9 1.7	-0.3352	0.5817	0.1676	+17	-52
ρ Leonis	4	1.18	10.7	9 53.4	13 25.4	- 6 55.0	-0.2551	0.5813	0.1704	+21	-47
49 Leonis	6	+1.17	-10.5	+ 9 14.2	14 22.5	- 6 0.0	+0.2367	0.5812	-0.1713	+49	-19
56 Leonis	6½	1.10	9.5	6 47.5	23 19.6	+ 2 37.6	+1.1064	0.5805	0.1795	+90	+34
c Leonis	5	1.07	9.3	6 42.7	23 1 20.6	+ 4 34.1	+0.8214	0.5801	0.1812	+90	+13
χ Leonis	5	1.04	9.4	7 56.9	3 10.5	+ 6 20.0	-0.7447	0.5799	0.1827	- 6	-80
σ Leonis	4	0.99	8.7	6 39.1	10 3.7	-11 1.8	-0.7292	0.5794	0.1878	- 5	-83
89 Leonis	6	+0.97	- 7.6	+ 3 41.5	15 44.7	- 5 33.1	+1.1418	0.5789	-0.1912	+90	+36
10 Virginis	6½	0.85	6.3	+ 2 32.2	24 6 54.7	+ 9 4.1	-0.6604	0.5785	0.1970	- 1	-83
η Virginis	4	0.84	5.4	- 0 2.1	11 18.7	-10 41.4	+1.0335	0.5782	0.1976	+90	+26
γ Virginis	3	0.81	- 4.3	0 49.6	20 42.0	- 1 38.4	-0.0382	0.5780	0.1977	+33	-37
				NEW	*MOON.*						
γ Libræ	4½	+0.95	+ 3.9	-14 24.4	27 23 1.5	- 2 0.0	+0.5947	0.5781	-0.1345	+67	- 2
η Libræ	6	0.97	4.1	15 18.4	28 2 39.3	+ 1 29.9	+1.0382	0.5805	0.1294	+75	+28
48 Libræ	5½	0.99	5.0	13 56.9	8 41.6	+ 7 19.1	-1.1066	0.5803	0.1198	-41	-90
49 Libræ	6	1.01	4.9	16 11.1	9 36.0	+ 8 11.5	+1.0797	0.5803	0.1184	+74	+32
φ Ophiuchi	4½	+1.10	+ 6.1	-16 21.8	22 43.0	- 3 10.0	-0.1449	0.5793	-0.0964	+16	-44
24 Scorpii	5½	1.12	6.4	17 31.2	29 3 9.4	+ 1 6.8	+0.6431	0.5789	0.0891	+67	+ 2
29 Ophiuchi	6½	1.20	6.9	18 43.0	11 50.1	+ 9 28.7	+1.1888	0.5776	0.0732	+72	+45
B. A. C. 6294	5½	1.51	10.7	18 28.6	31 2 57.5	- 0 47.1	-0.5177	0.5670	-0.0014	-13	-71
Lalande 35497	6½	1.62	11.5	19 24.4	17 9.3	-11 4.5	+0.6383	0.5614	+0.0235	+61	+ 2
B. A. C. 6536	6	+1.66	+11.7	-19 27.9	19 31.5	- 8 47.2	+0.7630	0.5605	+0.0280	+71	+ 9
d Sagittarii	5	+1.68	+11.9	-19 9.1	23 48.4	- 4 38.9	+0.5613	0.5588	+0.0351	+55	- 3

NOVEMBER.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
ρ^1 Sagittarii	4	+1.70	+12.4	-18 3.5	1 1 41.1	- 2 50.1	-0.5530	0.5581	+0.0384	-11	-74
ρ^2 Sagittarii	6½	1.70	12.3	18 31.0	1 44.9	- 2 46.4	-0.0540	0.5581	0.0384	+16	-38
B. A. C. 6707	6½	1.77	12.6	19 6.0	8 28.7	+ 3 43.9	+0.8726	0.5550	0.0495	+71	+17
B. A. C. 6710	6	1.76	12.9	18 28.9	8 46.9	+ 4 1.5	+0.2187	0.5549	0.0499	+33	-23
τ^1 Capricorni	6½	2.00	15.5	15 32.2	2 13 28.4	+ 7 47.2	-0.9430	0.5423	0.0927	-30	-90
τ^2 Capricorni	5½	+2.01	+15.6	-15 21.0	14 24.7	+ 8 41.7	-1.0602	0.5417	+0.0938	-39	-90
B. A. C. 7263	6	2.10	15.5	16 27.9	23 24.2	- 6 35.7	+1.0595	0.5384	0.1054	+74	+30
Lalande 40522	6	2.10	16.1	14 55.1	23 56.8	- 6 4.1	-0.5848	0.5384	0.1058	- 6	-77
29 Capricorni	5½	2.18	16.1	15 38.4	3 8 23.4	+ 2 6.8	+1.1460	0.5348	0.1162	+75	+38
18 Aquarii	5½	2.20	16.8	13 21.7	12 39.0	+ 6 14.6	-0.8606	0.5335	0.1208	-21	-90
λ Capricorni	5½	+2.29	+17.6	-11 53.2	23 59.0	- 6 45.9	-1.0537	0.5299	+0.1326	-33	-90
e^2 Aquarii	5½	+2.40	+17.7	-12 7.2	4 12 20.6	+ 5 13.5	+0.9166	0.5262	+0.1441	+78	+18

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
λ Aquarii	4	+2.58	+18.6	− 8 10.9	5 10 16.4	+ 2 30.8	−0.0849	0.5223	+0.1609	+28	−40
78 Aquarii	6½	2.59	18.7	7 48.3	11 18.2	+ 3 30.8	−0.3357	0.5222	0.1614	+15	−55
81 Aquarii	6½	2.62	18.6	7 40.1	14 53.7	+ 7 0.1	+0.0977	0.5217	0.1638	+39	−30
82 Aquarii	6½	2.63	18.8	7 10.9	15 30.2	+ 7 35.5	−0.3412	0.5214	0.1643	+15	−56
h¹ Aquarii	5½	2.63	18.4	8 18.2	16 52.0	+ 8 54.9	+1.1231	0.5213	0.1650	+82	+33
φ Aquarii	4	+2.67	+18.8	− 6 39.5	21 43.0	−10 22.5	+0.1125	0.5208	+0.1677	+40	−29
96 Aquarii	5½	2.70	18.9	5 44.6	6 0 23.4	− 7 46.7	−0.4496	0.5208	0.1691	+ 9	−64
B. A. C. 8184	6	2.75	18.9	5 9.0	5 45.1	− 2 34.3	−0.1915	0.5206	0.1716	+23	−46
20 Piscium	5½	2.83	19.0	3 23.4	15 29.8	+ 6 53.6	−0 4432	0.5207	0.1754	+10	−63
24 Piscium	6	2.85	18.7	3 47.0	18 8.0	+ 9 27.2	+0.4539	0.5210	0.1763	+63	−10
29 Piscium	5	+2.88	+18.3	− 3 39.4	22 50.4	− 9 58.5	+1.1458	0.5214	+0.1776	+87	+35
4 Ceti	6	2.91	18.3	3 10.7	7 1 57.5	− 6 56.7	+1.1725	0.5214	0.1783	+87	+37
5 Ceti	6	2.91	18.3	3 4.7	2 12.5	− 6 40.2	+1.1064	0.5215	0.1783	+87	+31
B. A. C. 5	5½	2.91	18.4	2 51.2	2 28.6	− 6 26.6	+0.9082	0.5217	0.1785	+87	+17
10 Ceti	6	3.00	18.1	− 0 40.5	11 53.8	+ 2 42.3	+0.1995	0.5229	0.1799	+47	−24
B. A. C. 237	6½	+3.12	+17.6	+ 2 46.3	8 0 47.3	− 8 46.8	−1.2511	0.5255	+0.1803	−46	−87
f Piscium	5	3.22	16.2	3 1.2	14 28.8	+ 4 30.4	+0.9354	0.5295	0.1783	+90	+19
μ Piscium	5	3.29	16.0	5 33.6	20 46.1	+10 36.5	−0.7103	0.5316	0.1767	− 4	−73
ν Piscium	4½	3.32	15.3	4 55.0	9 2 29.9	− 7 50.1	+0.9945	0.5337	0.1747	+90	+24
64 Ceti	5½	3.45	13.5	8 2.4	17 25.7	+ 6 38.3	+0.1708	0.5398	0.1672	+45	−23
ξ¹ Ceti	4	+3.46	+13.4	+ 8 18.9	18 14.0	+ 7 25.1	+0.0072	0.5398	+0.1670	+36	−32
ξ Arietis	5	3.52	12.6	10 5.8	10 0 0.7	−10 59.0	−0.9563	0.5425	0.1633	−20	−80
B. A. C. 755	6½	3.51	12.3	10 3.3	0 57.7	−10 3.7	−0.7568	0.5430	0.1625	− 7	−74
85 Ceti	6	3.55	11.2	10 15.5	8 35.1	− 2 40.7	+0.2413	0.5466	0.1564	+49	−18
μ Ceti	4	3.54	10.9	9 38.2	9 45.5	− 1 32.6	+1.0919	0.5473	0.1557	+90	+35
Lalande 5725	6	+3.64	+ 9.3	+12 45.3	19 57.0	+ 8 19.2	−0.7065	0.5521	+0.1463	− 5	−77
f Tauri	4	3.65	7.0	12 32.8	11 7 23.3	− 4 37.0	+1.1163	0.5575	0.1342	+90	+39
48 Tauri	6	3.72	3.0	15 7.1	12 3 43.1	− 8 58.6	+0.8387	0.5680	0.1067	+90	+22
γ Tauri	4	3.72	2.6	15 21.2	5 30.2	− 7 15.3	+0.7802	0.5689	0.1039	+90	+18
δ¹ Tauri	4	3.76	2.2	17 16.5	6 51.8	− 5 56.4	−1.1064	0.5693	0.1020	−34	−73
63 Tauri	6	+3.74	+ 2.2	+16 30.6	7 5.6	− 5 43.1	−0.2774	0.5694	+0.1019	+20	−41
δ³ Tauri	5½	3.76	2.0	17 10.8	7 22.9	− 5 26.4	−0.9535	0.5694	0.1016	−22	−73
70 Tauri	6	3.72	2.0	15 40.8	8 5.1	− 4 45.7	+0.6985	0.5701	0.1004	+90	+14
71 Tauri	6	3.71	1.9	15 21.6	8 24.6	− 4 26.9	+1.0673	0.5705	0.0994	+90	+39
75 Tauri	6	3.73	1.7	16 6.3	9 19.7	− 3 33.7	+0.3737	0.5705	0.0986	+58	− 4
θ¹ Tauri	4	+3.72	+ 1.7	+15 42.6	9 23.4	− 3 30.1	+0.7966	0.5705	+0.0986	+90	+20
θ² Tauri	4	3.72	1.7	15 37.1	9 25.8	− 3 27.8	+0.8966	0.5709	0.0977	+90	+27
80 Tauri	6	3.71	1.6	15 23.3	10 5.5	− 2 49.5	+1.2034	0.5709	0.0972	+90	+53
B. A. C. 1391	5	3.72	1.5	15 56.8	10 15.8	− 2 39.6	+0.6316	0.5709	0.0972	+82	+10
81 Tauri	6	3.71	1.6	15 26.7	10 18.7	− 2 36.8	+1.1647	0.5709	0.0968	+90	+49
85 Tauri	6½	+3.71	+ 1.5	+15 36.4	10 50.6	− 2 6.0	+1.0452	0.5712	+0.0957	+90	+38
α Tauri	1	3.73	1.0	16 16.8	12 37.0	− 0 23.3	+0.5029	0.5720	0.0929	+69	+ 3
σ² Tauri	5	3.71	+ 0.8	15 41.5	14 6.0	+ 1 2.6	+1.2578	0.5728	0.0909	+90	+62
B. A. C. 1526	5	3.71	− 1.1	16 58.5	21 58.2	+ 8 38.0	+0.5712	0.5759	0.0776	+76	+ 9
m Tauri	5	3.73	2.2	18 29.5	13 2 15.5	−11 14.0	−0.7012	0.5776	0.0704	− 5	−70
111 Tauri	5½	+3.67	− 3.6	+17 16.5	9 34.7	− 4 10.6	+1.0351	0.5803	+0.0567	+90	+41
115 Tauri	6	3.68	4.0	17 51.8	10 45.0	− 3 2.9	+0.4852	0.5808	0.0546	+68	+ 6
117 Tauri	6	3.66	3.9	17 8.6	11 7.8	− 2 40.9	+1.2572	0.5808	0.0543	+90	+66
119 Tauri	5	3.67	4.4	18 30.4	12 53.1	− 0 59.4	−0.0730	0.5813	0.0507	+31	−24
120 Tauri	6	3.67	4.5	18 27.4	13 26.7	− 0 27.1	+0.0070	0.5817	0.0494	+35	−19
127 Tauri	6	+3.65	− 5.4	+18 55.3	17 24.2	+ 3 21.8	−0.2950	0.5830	+0.0418	+18	−37
130 Tauri	6	3.62	5.7	17 41.1	19 21.1	+ 5 14.3	+1.0698	0.5830	0.0389	+90	+46
χ² Orionis	6	3.63	6.6	19 43.5	22 28.3	+ 8 14.6	−0.9408	0.5844	0.0322	−22	−71
χ³ Orionis	6	3.59	7.5	19 41.5	14 2 3.0	+11 41.5	−0.8013	0.5851	0.0258	−12	−71
68 Orionis	6	3.56	8.1	19 48.8	5 38.4	− 8 51.0	−0.8470	0.5860	0.0183	−15	−71
71 Orionis	6	+3.54	− 8.2	+19 11.5	6 50.4	− 7 41.7	−0.1815	0.5861	+0.0161	+25	−27
W. vii., 685	6	+3.13	−13.3	+17 19.6	15 14 51.1	− 0 52.9	+1.2246	0.5880	−0.0480	+90	+61

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
f Geminorum	6	+3.09	-13.9	+17 55.9	15 18 1.4	+ 2 10.3	+0.4416	0.5879	-0.0541	+64	+ 4
g Geminorum	5	3.06	14.4	18 47.1	20 46.4	+ 4 49.1	-0.5917	0.5878	0.0597	+ 1	-59
3 Cancri	6	2.96	14.9	17 37.0	16 2 53.1	+10 42.0	+0.2065	0.5870	0.0712	+48	-11
5 Cancri	6	2.94	14.6	16 46.0	3 11.9	+11 0.1	+1.0551	0.5870	0.0717	+90	+41
ζ^1 Cancri	4½	2.89	15.5	17 59.1	7 38.0	- 8 43.7	-0.5304	0.5861	0.0790	+ 5	-56
d^2 Cancri	6	+2.81	-15.9	+17 25.0	13 20.8	- 3 13.7	-0.4378	0.5855	-0.0903	+10	-51
54 Cancri	6	2.61	16.3	15 46.1	23 56.4	+ 6 58.4	+0.1870	0.5831	0.1089	+47	-15
o^1 Cancri	5½	2.56	16.5	15 45.3	17 2 33.2	+ 9 29.5	-0.0900	0.5826	0.1136	+30	-31
o^2 Cancri	6	2.57	16.6	16 0.8	2 41.5	+ 9 37.4	-0.3702	0.5824	0.1138	+14	-48
π^1 Cancri	6	2.48	16.8	15 27.0	8 57.2	- 8 20.7	-0.5378	0.5811	0.1237	+ 5	-61
π^2 Cancri	6	+2.47	-16.8	+15 24.5	10 10.5	- 7 10.1	-0.6479	0.5808	-0.1253	- 1	-70
18 Leonis	6	2.25	16.2	12 19.9	23 30.4	+ 5 40.7	+0.6753	0.5776	0.1451	+87	+ 8
23 Leonis	6	2.22	16.7	13 35.6	18 1 29.0	+ 7 35.0	-0.8966	0.5771	0.1477	-17	-77
ν Leonis	5	2.17	16.5	12 59.1	4 35.2	+10 34.5	-0.7423	0.5764	0.1517	- 7	-76
A Leonis	4½	2.10	15.7	10 33.1	8 47.5	- 9 22.3	+1.0784	0.5755	0.1567	+90	+34
α Leonis	1½	+2.09	-16.4	+12 31.3	8 59.2	- 9 11.0	-0.9499	0.5755	-0.1569	-20	-78
44 Leonis	6	2.00	15.2	9 21.5	16 19.2	- 2 6.8	+1.0735	0.5737	0.1649	+90	+32
45 Leonis	6	1.98	15.5	10 20.3	17 21.3	- 1 6.9	-0.0895	0.5735	0.1661	+30	-37
ρ Leonis	4	1.95	15.4	9 53.3	19 36.4	+ 1 3.5	-0.0118	0.5728	0.1688	+35	-33
49 Leonis	6	1.95	15.1	9 14.1	20 35.0	+ 1 59.9	+0.4842	0.5727	0.1697	+67	- 6
c Leonis	5	+1.81	-13.9	+ 6 42.7	19 7 51.4	-11 7.6	+1.0671	0.5707	-0.1797	+90	+30
χ Leonis	5	1.78	14.2	7 56.9	9 44.7	- 9 18.3	-0.5241	0.5705	0.1811	+ 6	-67
σ Leonis	4	1.70	13.4	6 39.0	16 50.6	- 2 27.3	-0.5171	0.5696	0.1861	+ 7	-67
10 Virginis	6½	1.47	10.6	+ 2 32.1	20 14 22.4	- 5 40.6	-0.4779	0.5675	0.1950	+ 9	-66
η Virginis	4	1.45	9.5	- 0 2.2	18 55.2	- 1 17.3	+1.2286	0.5672	0.1959	+90	+43
γ Virginis	3	+1.37	- 8.3	- 0 49.6	21 4 37.3	+ 8 4.7	+0.1229	0.5675	-0.1962	+42	-28
38 Virginis	6	1.34	7.6	2 56.1	9 43.1	-11 0.2	+1.2546	0.5678	0.1957	+87	+46
k Virginis	6	1.34	6.9	3 12.0	12 34.9	- 8 14.3	+0.9618	0.5680	0.1952	+87	+20
46 Virginis	6	1.33	6.9	2 45.4	13 0.1	- 7 50.0	+0.4312	0.5680	0.1951	+62	-12
48 Virginis	6½	1.32	6.7	3 3.1	14 28.1	- 6 25.1	+0.4448	0.5682	0.1947	+63	-11
65 Virginis	6	+1.27	- 5.6	- 4 19.8	23 4.2	+ 1 53.1	+0.0742	0.5692	-0.1919	+39	-31
66 Virginis	6	1.26	5.4	4 34.2	23 36.3	+ 2 24.1	+0.2124	0.5692	0.1915	+47	-23
l^1 Virginis	6½	1.26	4.9	5 52.9	22 2 12.2	+ 4 54.5	+1.0457	0.5693	0.1905	+84	+26
l^2 Virginis	5	1.26	4.8	5 40.2	2 53.6	+ 5 34.4	+0.7000	0.5696	0.1901	+84	+ 3
80 Virginis	6	1.23	4.9	4 49.0	4 27.9	+ 7 5.5	-0.4623	0.5697	0.1892	+ 9	-65
88 Virginis	6½	+1.20	- 3.9	- 6 16.2	10 5.9	-11 28.4	-0.0490	0.5701	-0.1861	+31	-38
B.A.C.4647 *mult.*	6½	1.20	3.3	7 30.0	13 2.0	- 8 38.4	+0.6556	0.5709	0.1842	+79	+ 1
94 Virginis	6½	1.19	2.6	8 20.9	17 59.8	- 3 51.1	+0.6124	0.5716	0.1805	+74	- 2
95 Virginis	6	1.19	- 2.5	8 46.2	18 11.0	- 3 40.3	+1.0065	0.5716	0.1805	+82	+24
				NEW	*MOON.*						
B. A. C. 6294	5½	+1.28	+10.3	-18 28.6	27 12 18.7	+10 22.1	-0.7192	0.5724	-0.0035	-25	-90
Lalande 35497	6½	1.37	11.2	19 24.4	28 2 17.1	- 0 8.9	+0.4066	0.5672	+0.0216	+57	-12
B. A. C. 6536	6	1.39	11.3	19 27.9	4 36.8	+ 2 6.0	+0.5267	0.5661	0.0268	+51	- 5
d Sagittarii	5	1.40	11.6	19 9.1	8 49.5	+ 6 10.0	+0.3185	0.5646	0.0340	+37	-17
ρ^1 Sagittarii	4	+1.40	+11.8	-18 3.5	10 40.1	+ 7 56.8	-0.7898	0.5637	+0.0373	-26	-90
ρ^2 Sagittarii	6½	1.40	11.8	18 31.0	10 43.9	+ 8 0.5	-0.2954	0.5637	0.0374	+ 3	-54
B. A. C. 6707	6½	1.46	12.1	19 6.0	17 20.9	- 9 36.0	+0.6180	0.5611	0.0482	+61	0
B. A. C. 6710	6	1·46	12.2	18 28.9	17 38.6	- 9 19.0	-0.0341	0.5607	0.0492	+18	-37
57 Sagittarii	6	1.52	12.5	19 19.9	29 0 34.8	- 2 36.7	+1.2636	0.5575	0.0606	+71	+59
B. A. C. 7263	6	+1.71	+14.2	-16 28.0	30 7 39.5	+ 3 27.4	+0.7588	0.5425	+0.1054	+74	+ 8
Lalande 40522	6	1.71	14.7	14 55.2	8 11.6	+ 3 58.5	-0.8776	0.5425	0.1058	-24	-90
29 Capricorni	5½	1.79	14.6	15 38.5	16 31.9	-11 56.9	+0.8397	0.5380	0.1165	+75	+13
18 Aquarii	5½	+1.81	+15.3	-13 21.7	20 44.7	- 7 52.0	-1.1647	0.5363	+0.1212	-45	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0.		Apparent Declination	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
42 Capricorni	5½	+1.89	+14.9	-14 33.1	1 5 25.7	+ 0 33.1	+1.2388	0.5326	+0.1308	+76	+48
e^2 Aquarii	5½	2.03	15.6	12 7.2	20 15.3	- 9 4.0	+0.6017	0.5272	0.1444	+70	- 2
σ Aquarii	5	2.13	15.7	11 15.4	2 6 37.2	+ 0 59.5	+1.1940	0.5240	0.1534	+79	+41
λ Aquarii	4	2.22	16.5	8 10.9	18 8.3	-11 49.6	-0.3964	0.5210	0.1612	+11	-60
78 Aquarii	6½	2.23	16.6	7 48.3	19 10.2	-10 49.5	-0.6452	0.5208	0.1617	- 3	-82
81 Aquarii	6½	+2.28	+16.5	- 7 40.1	22 46.0	- 7 19.9	-0.2119	0.5200	+0.1641	+22	-48
82 Aquarii	6½	2.28	16.6	7 10.9	23 22.6	- 6 44.4	-0.6489	0.5200	0.1643	- 2	-82
h^1 Aquarii	5½	2.29	16.3	8 18.2	3 0 44.5	- 5 24.8	+0.8168	0.5198	0.1652	+82	+11
φ Aquarii	4	2.35	16.7	6 39.5	5 36.2	- 0 41.5	-0.1935	0.5188	0.1679	+23	-47
96 Aquarii	5½	2.39	16.8	5 44.6	8 17.3	+ 1 55.0	-0.7539	0.5187	0.1690	- 8	-90
B. A. C. 8184	6	+2.44	+16.8	- 5 9.0	13 40.3	+ 7 8.7	-0.4919	0.5181	+0.1717	+ 7	-67
20 Piscium	5½	2.54	16.9	3 23.4	23 28.3	- 7 20.1	-0.7325	0.5177	0.1756	- 6	-90
24 Piscium	6	2.57	16.6	3 47.0	4 2 7.6	- 4 45.4	+0.1674	0.5177	0.1762	+44	-26
27 Piscium	5	2.59	16.3	4 11.0	5 11.7	- 1 46.6	+1.1508	0.5177	0.1770	+86	+35
29 Piscium	5	2.61	16.3	3 39.4	6 52.0	- 0 9.1	+0.8658	0.5178	0.1775	+87	+14
4 Ceti	6	+2.64	+16.3	- 3 10.7	10 0.6	+ 2 54.1	+0.8966	0.5178	+0.1784	+87	+16
5 Ceti	6	2.64	16.3	3 4.7	10 15.6	+ 3 8.6	+0.8303	0.5178	0.1784	+87	+11
B. A. C. 5	5½	2.65	16.3	2 51.2	10 31.9	+ 3 24.5	+0.6338	0.5182	0.1785	+79	0
10 Ceti	6	2.77	16.3	0 40.5	20 1.9	-11 21.9	-0.0623	0.5190	0.1800	+32	-39
14 Ceti	6	2.80	15.8	- 1 7.6	5 0 45.0	- 6 46.9	+1.2835	0.5199	0.1805	+89	+51
33 Ceti	6	+3.02	+14.8	+ 1 50.6	19 6.3	+11 2.4	+1.3344	0.5243	+0.1797	+90	+63
f Piscium	5	3.08	14.7	3 1.1	22 51.3	- 9 19.3	+0.7216	0.5256	0.1791	+90	+ 5
μ Piscium	5	3.17	14.7	5 33.5	6 5 11.8	- 3 10.0	-0.9120	0.5277	0.1775	-17	-85
ν Piscium	4½	3.21	13.8	4 54.9	10 58.3	+ 2 26.1	+0.8050	0.5302	0.1757	+90	+11
64 Ceti	5½	3.41	12.4	8 2.4	7 1 59.6	- 6 59.9	+0.0126	0.5369	0.1688	+36	-33
ξ^1 Ceti	4	+3.43	+12.4	+ 8 18.9	2 48.0	- 6 13.0	-0.1473	0.5373	+0.1684	+27	-42
ξ Arietis	5	3.51	11.9	10 5.8	8 36.2	- 0 35.6	-1.0967	0.5404	0.1686	-31	-80
B. A. C. 755	6½	3.52	11.7	10 3.3	9 33.3	+ 0 19.7	-0.8956	0.5412	0.1679	-16	-80
85 Ceti	6	3.59	10.5	10 15.5	17 11.9	+ 7 43.9	+0.1214	0.5449	0.1587	+43	-25
μ Ceti	4	3.58	10.1	9 38.2	18 22.4	+ 8 52.2	+0.9718	0.5455	0.1579	+90	+25
Lalande 5725	6	+3.73	+ 8.8	+12 45.2	8 4 33.5	- 5 16.4	-0.7932	0.5517	+0.1485	-10	-78
f Tauri	4	3.82	6.5	12 32.8	15 57.4	+ 5 45.0	+1.0498	0.5586	0.1366	+90	+34
48 Tauri	6	4.00	2.6	15 7.0	9 12 7.1	+ 1 13.1	+0.8279	0.5709	0.1101	+90	+21
γ Tauri	4	4.02	2.2	15 21.2	13 52.9	+ 2 55.2	+0.7696	0.5720	0.1073	+90	+17
δ^1 Tauri	4	4.08	2.0	17 16.5	15 13.4	+ 4 12.9	-1.0988	0.5727	0.1055	-33	-73
63 Tauri	6	+4.05	+ 1.8	+16 30.6	15 27.0	+ 4 26.1	-0.2737	0.5731	+0.1046	+20	-41
δ^2 Tauri	5½	4.07	1.9	17 10.8	15 44.0	+ 4 42.4	-0.9452	0.5731	0.1045	-21	-73
70 Tauri	6	4.04	1.6	15 40.8	16 25.7	+ 5 22.6	+0.6953	0.5737	0.1030	+90	+13
71 Tauri	6	4.03	1.5	15 21.6	16 45.1	+ 5 41.4	+1.0629	0.5737	0.1028	+90	+38
75 Tauri	6	4.06	1.3	16 6.3	17 39.4	+ 6 33.7	+0.3762	0.5742	0.1012	+59	- 4
θ^1 Tauri	4	+4.04	+ 1.3	+15 42.6	17 43.0	+ 6 37.3	+0.7941	0.5743	+0.1012	+90	+20
θ^2 Tauri	4	4.04	1.3	15 37.1	17 45.4	+ 6 39.6	+0.8952	0.5744	0.1012	+90	+26
80 Tauri	6	4.03	1.0	15 23.3	18 24.4	+ 7 17.2	+1.2014	0.5748	0.1000	+90	+53
B. A. C. 1391	5	4.05	1.1	15 56.8	18 34.6	+ 7 27.0	+0.6354	0.5748	0.0998	+83	+10
81 Tauri	6	4.03	1.0	15 26.7	18 37.5	+ 7 29.8	+1.1628	0.5748	0.0997	+90	+48
85 Tauri	6½	+4.05	+ 1.0	+15 36.4	19 9.1	+ 8 0.3	+1.0459	0.5749	+0.0992	+90	+38
α Tauri	1	4.07	0.6	16 16.8	20 54.1	+ 9 41.6	+0.5147	0.5760	0.0964	+70	+ 4
σ^2 Tauri	5	4.06	+ 0.1	15 41.5	22 21.7	+11 6.0	+1.2671	0.5766	0.0942	+90	+64
B. A. C. 1526	5	4.11	- 1.7	16 58.5	10 6 6.2	- 5 26.3	+0.6025	0.5809	0.0809	+79	+10
π Tauri	5	4.15	2.6	18 29.5	10 19.0	- 1 22.7	-0.6465	0.5832	0.0736	- 2	-65
111 Tauri	5½	+4.12	- 4.4	+17 16.5	17 29.7	+ 5 32.2	+1.0909	0.5867	+0.0598	+90	+45
115 Tauri	6	4.13	4.7	17 51.8	18 38.5	+ 6 38.4	+0.5511	0.5869	0.0577	+74	+10
119 Tauri	5	4.15	5.2	18 30.4	20 44.0	+ 8 39.2	+0.0034	0.5879	0.0537	+35	-20
120 Tauri	6	4.14	5.3	18 27.4	21 16.9	+ 9 10.9	+0.0843	0.5880	0.0530	+40	-15
127 Tauri	6	4.15	6.2	18 55.3	11 1 9.4	-11 5.4	-0.2061	0.5894	0.0455	+23	-31
130 Tauri	6	+4.12	- 6.6	+17 41.1	3 3.5	- 9 15.6	+1.1497	0.5902	+0.0417	+90	+53
χ^2 Orionis	6	+4.17	- 7.5	+19 43.5	6 6.6	- 6 19.4	-0.8331	0.5913	+0.0355	-14	-71

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS:

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0. $\Delta\alpha$	$\Delta\delta$	Apparent Declination	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	"	° ′	d h m	h m				°	°
χ^3 Orionis	6	+4.15	- 8.3	+19 41.5	11 9 36.2	- 2 57.7	-0.6866	0.5926	+0.0281	- 4	-66
χ^4 Orionis	5	4.16	8.3	20 8.3	9 47.1	- 2 47.1	-1.1400	0.5926	0.0279	-40	-70
68 Orionis	6	4.14	9.1	19 48.7	13 6.3	+ 0 24.5	-0.7233	0.5935	0.0214	- 7	-70
71 Orionis	6	4.13	9.3	19 11.4	14 16.7	+ 1 32.2	-0.0615	0.5936	0.0190	+32	-20
ν Geminorum	4½	4.13	10.7	20 16.8	19 59.7	+ 7 2.0	-1.1038	0.5951	+0.0068	-36	-70
f Geminorum	6	+3.86	-16.4	+17 55.8	13 0 32.6	+10 28.9	+0.6263	0.5963	-0.0533	+83	+14
g Geminorum	5	3.83	17.0	18 47.0	3 13.3	-10 56.5	-0.3891	0.5962	0.0584	+13	-44
3 Cancri	6	3.75	17.6	17 36.9	9 10.6	- 5 13.0	+0.4106	0.5954	0.0703	+62	+ 1
5 Cancri	6	3.74	17.5	16 45.9	9 28.8	- 4 55.5	+1.2505	0.5952	0.0715	+90	+63
ζ^1 Cancri	4½	3.70	18.4	17 59.1	13 48.3	- 0 45.9	-0.3124	0.5944	0.0797	+18	-41
d^2 Cancri	6	+3.63	-19.0	+17 25.0	19 22.8	+ 4 35.8	-0.2093	0.5933	-0.0900	+23	-36
54 Cancri	6	3.46	20.1	15 46.1	14 5 44.0	- 9 26.6	+0.4230	0.5901	0.1092	+63	- 2
o^1 Cancri	5½	3.42	20.3	15 45.3	8 17.6	- 6 58.8	+0.1516	0.5895	0.1132	+44	-18
o^2 Cancri	6	3.43	20.4	16 0.8	8 25.6	- 6 51.2	-0.1246	0.5892	0.1141	+28	-33
π^1 Cancri	6	3.34	20.7	15 27.0	14 33.9	- 0 56.7	-0.2846	0.5872	0.1241	+19	-44
π^2 Cancri	6	+3.33	-20.9	+15 24.5	15 45.8	+ 0 12.5	-0.3924	0.5869	-0.1258	+13	-51
ϙ Leonis	6	3.19	21.3	14 52.9	15 0 25.1	+ 8 32.6	-1.0051	0.5834	0.1393	-25	-75
ψ Leonis	6	3.13	21.5	14 32.2	3 43.8	+11 44.0	-1.1264	0.5825	0.1436	-35	-76
18 Leonis	6	3.12	20.8	12 19.9	4 52.9	-11 9.5	+0.9345	0.5821	0.1451	+90	+25
23 Leonis	6	3.09	21.3	13 35.5	6 50.0	- 9 16.6	-0.6230	0.5813	0.1478	+ 1	-70
ν Leonis	5	+3.05	-21.3	+12 59.0	9 53.8	- 6 19.5	-0.4680	0.5802	-0.1519	+ 9	-59
α Leonis	1½	2.97	21.2	12 31.2	14 14.9	- 2 8.0	-0.6735	0.5785	0.1570	- 2	-76
45 Leonis	6	2.87	20.7	10 20.3	22 32.9	+ 5 52.0	+0.1870	0.5753	0.1667	+46	-21
ρ Leonis	4	2.84	20.6	9 53.3	16 0 47.2	+ 8 1.5	+0.2678	0.5745	0.1688	+51	-17
49 Leonis	6	2.83	20.3	9 14.1	1 45.5	+ 8 57.7	+0.7614	0.5741	0.1698	+90	+10
χ Leonis	5	+2.65	-19.7	+ 7 56.8	14 53.7	- 2 22.0	-0.2411	0.5696	-0.1811	+22	-48
σ Leonis	4	2.56	19.1	6 38.9	22 0.7	+ 4 30.1	-0.2346	0.5678	0.1858	+22	-48
b Virginis	6	2.37	16.5	4 17.1	17 15 21.3	- 2 45.3	-1.1366	0.5639	0.1933	-34	-86
10 Virginis	6½	2.31	16.2	+ 2 32.0	19 44.1	+ 1 28.5	-0.2082	0.5628	0.1945	+24	-47
γ Virginis	3	2.19	13.7	- 0 49.7	18 10 13.1	- 8 32.2	+0.3833	0.5611	0.1952	+59	-14
k Virginis	6	+2.12	-12.0	- 3 12.1	18 20.5	- 0 41.3	+1.2184	0.5609	-0.1942	+87	+42
46 Virginis	6	2.11	12.1	2 45.5	18 46.1	- 0 16.7	+0.6849	0.5609	0.1941	+85	+ 2
48 Virginis	6½	2.10	11.9	3 3.2	20 16.3	+ 1 10.5	+0.6952	0.5609	0.1937	+89	+ 3
65 Virginis	6	2.03	10.4	4 19.9	19 5 4.1	+ 9 40.4	+0.3081	0.5609	0.1909	+53	-18
66 Virginis	6	2.03	10.2	4 34.3	5 37.1	+10 12.2	+0.4478	0.5610	0.1905	+63	-11
l^1 Virginis	6½	+2.02	- 9.6	- 5 53.0	8 16.9	-11 13.4	+1.2844	0.5611	-0.1894	+84	+51
l^2 Virginis	5	2.01	9.5	5 40.3	8 59.2	-10 32.6	+0.9337	0.5611	0.1891	+84	+18
80 Virginis	6	1.98	9.5	4 49.1	10 35.9	- 8 59.1	-0.2438	0.5614	0.1882	+21	-50
88 Virginis	6½	1.93	8.5	6 16.2	16 22.6	- 3 24.3	+0.1639	0.5618	0.1849	+44	-26
B.A.C.4647 *mult.*	6½	1.93	7.8	7 30.0	19 23.4	- 0 29.6	+0.8696	0.5622	0.1829	+83	+14
94 Virginis	6½	+1.89	- 6.9	- 8 21.0	20 0 29.3	+ 4 25.9	+0.8158	0.5627	-0.1796	+82	+11
95 Virginis	6	1.89	6.7	8 46.3	0 40.8	+ 4 37.1	+1.2142	0.5627	0.1794	+81	+42
ξ^1 Libræ	6	1.75	3.1	11 26.1	22 2.2	+ 1 14.5	+0.3233	0.5662	0.1600	+50	-17
ξ^2 Libræ	5½	1.74	2.9	10 57.0	23 6.3	+ 2 16.3	-0.3457	0.5665	0.1588	+12	-57
18 Libræ	6	1.72	2.9	10 41.2	21 0 3.7	+ 3 11.7	-0.7707	0.5666	0.1578	-12	-90
B. A. C. 5070	6	+1.64	- 1.2	-11 57.7	11 8.1	-10 6.9	-1.1275	0.5689	-0.1443	-40	-90
γ Libræ	4½	1.68	- 0.1	14 24.5	16 14.5	- 5 11.3	+0.6897	0.5698	0.1376	+75	+ 3
η Libræ	6	1.67	+ 0.8	15 18.5	20 0.0	- 1 33.7	+1.1179	0.5705	0.1322	+75	+34
48 Libræ	5½	1.59	1.4	13 57.0	22 2 13.7	+ 4 27.0	-1.0909	0.5716	0.1235	-39	-90
49 Libræ	6	1.64	1.9	16 11.2	3 9.7	+ 5 21.0	+1.1225	0.5718	0.1220	+74	+35
ϕ Ophiuchi	4½	+1.56	+ 3.7	-16 21.8	16 35.8	- 5 41.3	-0.1864	0.5738	-0.1004	+15	-47
24 Scorpii	5½	1.56	4.4	17 31.2	21 7.3	- 1 19.5	+0.5866	0.5746	-0.0932	+62	- 2
				NEW	*MOON.*						
ρ Capricorni	5	1.51	12.7	18 11.2	27 2 15.4	+ 0 17.8	+1.1046	0.5531	+0.0851	+72	+35
B. A. C. 7263	6	+1.55	+13.3	-16 28.0	16 0.9	-10 23.3	+0.5430	0.5465	+0.1044	+60	- 5
Lalande 40522	6	+1.54	+13.5	-14 55.2	16 32.6	- 9 52.6	-1.0935	0.5461	+0.1055	-40	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1886.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
29 Capricorni	5½	+1.59	+13.7	-15 38.5	28 0 48.3	- 1 52.7	+0.6102	0.5423	+0.1158	+67	- 1
42 Capricorni	5½	1.65	13.7	14 33.1	13 35.0	+10 30.2	+0.9899	0.5364	0.1303	+76	+23
θ² Aquarii	5½	1.76	14.2	12 7.3	29 4 17.5	+ 0 45.9	+0.3384	0.5301	0.1443	+51	-17
σ Aquarii	5	1.83	14.2	11 15.5	14 35.7	+10 45.8	+0.9194	0.5261	0.1531	+79	+18
58 Aquarii	6½	1.83	14.1	11 29.1	15 7.7	+11 16.8	+1.2508	0.5260	0.1533	+79	+48
λ Aquarii	4	+1·92	+14.7	- 8 11.0	30 2 4.0	- 2 6.1	-0.6789	0 5226	+0.1611	- 5	-86
78 Aquarii	6½	1.93	14.7	7 48.4	3 5.7	- 1 6.3	-0.9298	0.5222	0.1616	-20	-90
81 Aquarii	6½	1.96	14.7	7 40.2	6 41.1	+ 2 22.9	-0.4982	0.5212	0.1639	+ 6	-68
82 Aquarii	6½	1.97	14.8	7 11.0	7 17.6	+ 2 58.3	-0.9374	0.5210	0.1641	-20	-90
h¹ Aquarii	5½	1.97	14.4	8 18.3	8 39.5	+ 4 17.9	+0.5315	0.5205	0.1650	+67	- 6
φ Aquarii	4	+2.03	+14.7	- 6 39.6	13 30.9	+ 9 0.9	-0.4838	0.5194	+0.1676	+ 7	-66
96 Aquarii	5½	2.05	14.8	5 44.7	16 12.1	+11 37.5	-1.0450	0.5189	0.1690	-28	-90
B. A. C. 8184	6	2.11	14.8	5 9.1	21 35.5	- 7 8.4	-0.7845	0.5178	0.1715	-10	-90
20 Piscium	5½	2.21	14.8	3 23.5	31 7 25.6	+ 2 25.0	-1.0297	0.5164	0.1751	-26	-90
24 Piscium	6	2.24	14.4	3 47.1	10 5.6	+ 5 0.4	-0.1254	0.5163	0.1758	+28	-42
27 Piscium	5	+2.27	+14.2	- 4 11.1	13 10.8	+ 8 0.3	+0 8594	0.5162	+0.1768	+86	+13
29 Piscium	5	2.29	14.2	3 39.5	14 51.8	+ 9 38.5	+0.5753	0.5159	0.1770	+74	- 4
4 Ceti	6	2.32	14.2	3 10.8	18 1.7	-11 17.0	+0.6082	0.5158	0.1776	+77	- 2
5 Ceti	6	2.33	14.2	3 4.8	18 16.8	-11 2.4	+0.5419	0.5159	0.1778	+71	- 6
B. A. C. 5	5½	+2.34	+14.2	- 2 51.3	18 33.2	-10 46.4	+0.3410	0.5159	+0.1778	+56	-17

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1886.

Date.	The Star's		IMMERSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle from		Washington.		Angle from		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
	NEW MOON.										
Jan. 16	α Tauri	1	21 48	2 4	348	38	Star 2′.8	north of	☽'s	limb.	
16	B. A. C. 1526	5	8 12	12 25	83	29	9 17	13 31	273	219	1 5
17	130 Tauri	6	1 49	6 0	113	165	2 52	7 3	234	279	1 3
24	38 Virginis †	6	5 45	9 27	80	131	6 34	10 17	318	9	0 49
27	γ Libræ	4½	9 38	13 8	84	141	10 36	14 6	305	353	0 58
27	η Libræ	6	15 22	18 51	146	131	16 23	19 52	269	258	1 1
	NEW MOON.										
Feb. 10	85 Ceti ‡	6	7 49	10 25	142	90	8 24	11 0	194	142	0 35
12	70 Tauri	6	5 1	7 29	114	94	6 5	8 33	226	185	1 4
12	75 Tauri	6	6 50	9 18	44	356	7 48	10 16	304	252	0 58
12	θ^1 Tauri	4	6 57	9 25	140	92	7 39	10 7	210	160	0 42
12	θ^2 Tauri	4	7 20	9 48	174	124	7 57	10 25	174	121	0 37
12	B. A. C. 1391	5	7 51	10 19	93	40	8 58	11 26	258	204	1 7
12	α Tauri	1	10 37	13 5	31	339	11 4	13 33	323	273	0 28
13	111 Tauri	5½	5 19	7 43	135	134	6 12	8 36	214	190	0 53
14	26 Geminorum ‡	5½	13 30	15 49	67	18	14 13	16 32	306	260	0 42
15	W. vii. 685	6	7 26	9 42	74	73	8 37	10 53	305	275	1 11
18	37 Sextantis	6	13 7	15 10	108	66	14 13	16 16	299	251	1 6
19	89 Leonis	6	7 17	9 17	72	121	8 8	10 8	330	16	0 52
21	l^1 Virginis	6½	10 9	12 1	67	108	10 58	12 49	343	18	0 48
	NEW MOON.										
Mar. 11	48 Tauri	6	9 52	10 33	133	80	10 31	11 12	219	168	0 39
11	γ Tauri *	4	11 27	12 8	92	45	12 15	12 56	260	213	0 48
20	38 Virginis *	6	5 59	6 5	103	152	6 51	6 57	294	345	0 52
20	θ Virginis	4½	15 37	15 42	138	101	16 39	16 44	265	221	1 2
24	24 Scorpii	5½	12 6	11 55	169	215	12 36	12 25	222	266	0 30
27	ρ^3 Sagittarii	6½	14 31	14 8	95	141	15 45	15 22	268	308	1 14
	NEW MOON.										
Apr. 5	64 Ceti	5½	8 31	7 34	167	116	Star 1′.3	south of	☽'s	limb.	
5	ξ^1 Ceti *	4	8 55	7 58	101	52	9 43	8 46	235	191	0 48
8	B. A. C. 1526	5	11 13	10 4	28	337	11 38	10 29	331	281	0 25
9	130 Tauri	6	7 30	6 18	138	95	8 25	7 12	224	173	0 54
11	1 Cancri	6	13 46	12 25	155	103	14 19	12 57	229	179	0 32
14	37 Sextantis	6	11 57	10 24	140	115	13 4	11 31	270	230	1 7
17	l^1 Virginis	6½	10 38	8 53	49	86	11 7	9 23	2	35	0 30
	NEW MOON.										
May 5	α Tauri	1	10 2	7 7	80	27	10 56	8 1	274	223	0 54
8	W. vii., 685	6	9 45	6 38	118	70	10 54	7 47	267	213	1 9
12	τ Leonis	5	15 44	12 21	203	153	Star 2′.3	south of	☽'s	limb.	
13	13 Virginis	6	12 53	9 26	87	75	14 2	10 35	326	296	1 9

Note.—The angles of position are counted from the north point and vertex of the moon's limb, toward the east.
* Whole occultation below the horizon of Washington.
† Immersion below the horizon of Washington.
‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1886.

Date.	The Star's		Immersion.				Emersion.				Duration of Occultation.
			Washington.		Angle from		Washington.		Angle from		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
May 13	Uranus		15 21	11 54	179	138	15 50	12 22	228	184	0 29
15	95 Virginis	6	13 49	10 14	25	28	Star 0′.4	north of	☽'s	limb.	
15	κ Virginis	4	17 36	14 0	126	84	18 38	15 2	266	219	1 2
17	49 Libræ	6	17 2	13 19	116	100	18 22	14 38	267	235	1 19
21	B. A. C. 6710	6	19 0	15 1	48	55	20 19	16 20	292	281	1 19
25	λ Aquarii	4	21 3	16 47	45	71	22 29	18 13	264	268	1 26
	NEW MOON.										
June 9	Jupiter		8 9	2 57	23	69	♃ 7′.2	north of	☽'s	limb.	
10	*k* Virginis	6	15 25	10 7	24	348	Star 8′.2	north of	☽'s	limb.	
13	γ Libræ	4½	14 2	8 32	29	50	Star 0′.5	north of	☽'s	limb.	
13	η Libræ	6	19 23	13 53	112	70	20 29	14 59	265	217	1 6
14	24 Scorpii	5½	21 36	16 2	66	18	22 30	16 56	299	249	0 54
17	B. A. C. 6536	6	14 17	8 32	184	231	Star 1′.5	south of	☽'s	limb.	
17	*d* Sagittarii	5	19 38	13 52	84	78	21 6	15 20	256	231	1 28
22	φ Aquarii	4	17 26	11 21	352	42	17 35	11 30	336	26	0 9
28	48 Tauri †	6	20 38	14 8	100	145	21 28	14 58	250	300	0 50
28	γ Tauri	4	22 13	15 43	74	126	23 10	16 41	254	308	0 57
	NEW MOON.										
July 5	56 Leonis	6½	16 2	9 6	110	58	16 57	10 1	289	238	0 55
6	β Virginis	3½	15 48	8 48	110	63	16 52	9 52	293	239	1 4
14	Lalande 35497	6½	22 21	14 49	122	83	23 14	15 41	217	172	0 53
20	24 Piscium	6	23 22	15 26	69	76	0 52	16 55	233	215	1 29
22	*f* Piscium †	5	18 44	10 41	106	157	19 32	11 28	214	265	0 48
27	130 Tauri †	6	22 7	13 44	87	131	22 56	14 32	256	306	0 49
	NEW MOON.										
Aug. 3	Jupiter		13 30	4 41	205	183	♃ 8′.0	south of	☽'s	limb.	
11	B. A. C. 6710	6	22 9	12 47	34	2	23 6	13 44	299	258	0 57
17	10 Ceti	6	2 25	16 39	28	355	3 31	17 44	281	238	1 5
22	70 Tauri	6	22 39	12 33	345	38	Star 2′.6	north of	☽'s	limb.	
22	71 Tauri	6	22 20	12 14	86	138	23 17	13 11	243	297	0 57
22	θ¹ Tauri	4	23 33	13 27	42	96	0 26	14 20	285	339	0 53
22	θ² Tauri	4	23 28	13 22	63	117	0 33	14 26	263	317	1 5
22	80 Tauri	6	0 35	14 27	163	217	Star 0′.8	south of	☽'s	limb.	
22	B. A. C. 1391	5	0 51	14 44	13	66	1 28	15 22	311	2	0 38
22	81 Tauri	6	0 44	14 38	151	204	0 59	14 53	174	226	0 15
22	85 Tauri	6½	1 11	15 4	119	171	2 3	15 57	206	252	0 52
22	*a* Tauri	1	4 19	17 53	31	45	5 21	18 54	301	287	1 1
23	111 Tauri	5½	23 28	13 18	75	128	0 25	14 14	270	325	0 57
23	117 Tauri	6	1 32	15 21	168	223	Star 4′.1	south of	☽'s	limb.	
	NEW MOON.										
31	*k* Virginis *	6	18 51	8 11	96	45	19 41	9 1	298	250	0 50
Sept. 1	B.A.C.4647 ‡ *mult.*	6½	18 59	8 15	53	2	19 30	8 46	338	287	0 31
4	24 Scorpii ‡	5½	20 53	9 57	120	75	21 51	10 54	245	194	0 57
7	*d* Sagittarii	5	19 41	8 33	98	91	21 7	9 58	243	218	1 26
15	ν Piscium	4½	23 42	12 1	153	186	Star 0′.9	south of	☽'s	limb.	

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OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1886.

Date.	The Star's		Immersion.				Emersion.				Duration of Occultation.
			Washington.		Angle from		Washington.		Angle from		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
Sept. 18	48 Tauri	6	2 33	14 40	105	141	3 47	15 54	221	231	1 14
18	γ Tauri	4	5 20	17 27	116	87	6 28	18 35	220	174	1 8
22	5 Cancri	6	1 39	13 30	121	172	2 28	14 19	242	296	0 49
24	A Leonis	4½	5 40	17 23	194	246	Star 1′.7	south of	☽'s	limb	
	NEW MOON.										
Oct. 4	Lalande 35497	6½	22 30	9 35	121	80	23 23	10 28	213	168	0 53
9	ϕ Aquarii ‡	4	4 43	15 28	54	3	5 39	16 24	266	216	0 56
10	24 Piscium	6	23 33	10 14	54	58	1 2	11 43	249	228	1 29
12	f Piscium †	5	18 32	5 6	95	145	19 24	5 58	226	277	0 52
16	B. A. C. 1526	5	5 13	15 30	96	85	6 36	16 53	247	206	1 23
19	f Geminorum	6	1 19	11 24	359	51	Star 3′.7	north of	☽'s	limb.	
21	18 Leonis	6	6 22	16 19	117	166	7 36	17 32	275	316	1 13
	NEW MOON.										
Nov. 1	B. A. C. 6707 *	6½	0 29	9 44	167	118	Star 0′.6	south of	☽'s	limb.	
7	10 Ceti	6	4 4	12 55	24	338	4 56	13 46	290	240	0 52
12	70 Tauri	6	21 45	6 17	65	115	22 40	7 11	264	317	0 54
12	71 Tauri	6	22 22	6 53	165	217	Star 3′.2	south of	☽'s	limb.	
12	75 Tauri	6	23 39	8 10	343	37	Star 0′.2	north of	☽'s	limb.	
12	θ^1 Tauri	4	23 2	7 33	101	154	23 57	8 29	216	270	0 55
12	θ^2 Tauri	4	23 11	7 42	128	182	23 47	8 18	199	253	0 36
12	B. A. C. 1391	5	0 0	8 31	80	134	1 9	9 40	245	297	1 9
12	α Tauri	1	3 9	11 40	95	129	4 29	13 0	234	234	1 20
13	115 Tauri	6	0 36	9 3	62	117	1 40	10 7	272	326	1 4
22	94 Virginis	6½	8 36	16 26	160	211	9 17	17 8	246	294	0 41
	NEW MOON.										
28	B. A. C. 6536	6	21 48	5 17	29	356	22 36	6 5	308	268	0 48
30	B. A. C. 7263	6	1 13	8 34	127	82	1 51	9 12	196	148	0 38
Dec. 4	27 Piscium	5	20 47	3 52	155	195	Star 0′.4	south of	☽'s	limb.	
4	29 Piscium	5	22 49	5 54	95	112	0 4	7 9	206	204	1 15
4	4 Ceti	6	3 51	10 56	156	111	Star 9′.7	south of	☽'s	limb.	
4	5 Ceti	6	4 14	11 18	159	113	Star 9′.2	south of	☽'s	limb.	
6	ν Piscium	4½	4 52	11 49	158	113	Star 7′.2	south of	☽'s	limb.	
9	γ Tauri	4	8 25	15 9	174	120	Star 4′.5	south of	☽'s	limb.	
9	70 Tauri	6	10 40	17 24	134	83	11 19	18 3	221	172	0 39
13	3 Cancri	6	1 0	7 29	64	114	1 47	8 16	298	350	0 47
18	46 Virginis	6	11 53	18 1	129	146	13 11	19 19	288	283	1 18
19	88 Virginis	6½	8 32	14 37	58	108	9 6	15 11	348	36	0 34
	NEW MOON.										
29	e^3 Aquarii	5½	23 43	5 10	335	313	Star 2′.9	north of	☽'s	limb.	
30	h^1 Aquarii ‡	5½	4 15	9 37	101	51	5 6	10 28	217	166	0 51

NOTE.—The angles of position are counted from the north point and vertex of the moon's limb, toward the east.
* Whole occultation below the horizon of Washington.
† Immersion below the horizon of Washington.
‡ Emersion below the horizon of Washington.

DOWNES'S TABLE GIVING VALUES OF τ.

FOR COMPUTING THE TIME AND HOUR-ANGLE OF APPARENT CONJUNCTION.

h		Lat. 72°			Lat. 66°			Lat. 60°			Lat .54°			Lat. 48°			Lat. 42°			Lat. 36°		
		x'			x'			x'			x'			x'			x'			x'		
		.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50
h	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	10	2	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	6	5	6	7
	20	3	3	4	4	5	5	5	6	7	6	7	9	8	9	11	9	10	12	11	12	14
	30	5	5	6	6	7	8	8	9	11	10	11	13	12	13	16	14	16	18	16	18	22
	40	6	7	8	8	9	11	11	12	14	13	15	17	16	18	21	18	21	24	21	24	29
	50	7	8	10	10	11	13	13	15	17	16	19	21	19	22	26	22	26	30	26	30	36
1	0	9	10	11	12	14	16	16	18	21	19	22	26	23	26	31	26	31	36	30	35	42
	10	10	12	13	14	16	18	18	21	24	22	26	30	26	30	36	31	35	42	35	40	48
	20	12	13	15	16	18	21	21	23	27	25	29	34	30	34	40	35	40	47	39	45	54
	30	13	15	17	18	20	23	23	26	30	28	32	37	33	38	45	39	44	52	43	50	59
	40	14	16	18	20	22	25	25	29	33	31	35	41	36	42	49	42	48	57	47	54	64
	50	16	18	20	21	24	28	27	31	36	34	38	44	39	45	53	45	52	61	51	58	68
2	0	17	19	22	23	26	30	29	33	39	36	41	47	42	48	56	48	55	65	54	62	72
	10	18	20	23	25	28	32	31	36	41	38	43	50	45	51	59	51	59	68	57	66	76
	20	19	22	24	26	30	34	33	38	43	40	46	53	47	54	62	54	62	71	60	69	90
	30	20	23	26	28	31	36	35	40	45	42	48	55	50	56	65	57	64	74	63	72	83
	40	21	24	27	29	33	37	37	42	47	44	50	58	52	59	68	59	67	77	65	74	86
	50	22	25	28	30	34	39	38	43	49	46	52	60	54	61	70	61	69	79	68	76	88
3	0	23	26	30	31	35	40	40	45	51	48	54	62	56	63	72	63	71	81	70	79	90
	10	24	27	31	33	36	42	41	46	53	49	56	63	57	65	74	65	73	83	72	81	92
	20	25	28	32	34	38	43	42	47	54	51	57	65	59	66	75	66	74	85	73	82	93
	30	26	29	33	35	39	44	43	49	55	52	58	66	60	67	77	68	76	86	74	83	95
	40	26	29	33	36	40	45	44	50	56	53	59	67	61	69	78	69	77	87	75	84	96
	50	27	30	34	36	41	46	45	51	57	54	60	68	62	70	79	70	78	88	76	85	96
4	0	28	31	35	37	41	47	46	52	58	55	61	69	63	70	79	71	79	89	77	86	97
	10	28	31	35	38	42	47	47	52	59	56	62	70	64	71	80	71	79	89	78	86	97
	20	29	32	36	38	42	48	47	53	59	56	62	70	64	71	80	72	80	89	78	87	97
	30	29	32	36	39	43	48	48	53	60	57	63	71	65	72	81	72	80	90	79	87	97
	40	29	33	37	39	43	49	48	53	60	57	63	71	65	72	81	72	80	89	79	87	97
	50	30	33	37	39	44	49	48	54	60	57	63	71	65	72	81	72	80	89	79	87	96
5	0	30	33	37	39	44	49	49	54	60	57	63	71	65	72	80	72	80	89	78	86	95
	10	30	33	37	40	44	49	49	54	60	57	63	71	65	72	80	72	79	88	78	86	95
	20	30	33	37	40	44	49	49	54	60	57	63	71	65	71	79	72	79	88	78	85	94
	30	30	33	37	40	44	49	49	54	60	57	63	70	64	71	79	71	78	87	77	85	93
	40	30	33	37	39	44	49	48	53	59	56	62	70	64	70	78	70	77	86	76	84	91
	50	30	33	37	39	43	48	48	53	59	56	61	69	63	70	77	70	77	85	75	83	90
6	0	30	33	37	39	43	48	48	52	58	55	61	68	63	69	76	69	76	84	74	82	89
	10	30	33	37	39	43	47	47	52	58	55	60	67	62	68	75	68	75	82	73	80	87
	20	29	32	36	38	42	47	47	51	57	54	60	66	61	67	74	67	73	81	72	79	85
	30	29	32	36	38	42	46	46	51	56	53	59	65	60	66	73	66	72	80	71	78	84
	40	29	32	35	37	41	46	45	50	55	53	58	64	59	65	71	65	71	78	70	76	82
	50	28	31	35	37	40	45	45	49	54	52	57	62	58	63	70	63	69	76	68	74	80
7	0	28	31	34	36	40	44	44	48	53	51	55	61	57	62	68	62	68	75	67	73	78
	10	27	30	34	35	39	43	43	47	52	50	54	60	56	61	67	61	66	73	65	71	76
	20	27	30	33	35	38	42	42	46	51	48	53	58	54	59	65	59	65	71	64	69	74
	30	26	29	32	34	37	41	41	45	49	47	52	57	53	58	63	58	63	69	62	67	71
	40	26	28	31	33	36	40	40	44	48	46	50	55	51	56	62	56	61	67			
	50	25	27	31	32	35	39	39	42	47	45	49	53	50	54	60	54	59	65			
8	0	24	27	30	31	34	38	38	41	45	43	47	52	48	52	58	53	57	63			
	10	24	26	29	30	33	37	36	40	44	42	46	50	47	51	56	52	55	60			
	20	23	25	28	29	32	35	35	38	42	40	44	48	45	49	54						
	30	22	24	27	28	31	34	34	37	41	39	42	46	43	47	52						
	40	21	23	26	27	30	33	33	35	39	37	41	44	41	45	49						
	50	20	22	25	26	28	31	31	34	37	36	39	42	40	43	47						
9	0	19	21	24	25	27	30	30	32	35	34	37	40									
	10	18	20	22	24	26	28	28	31	34	32	35	38									
	20	18	19	21	22	24	27	27	29	32	31	33	36									
	30	16	18	20	21	23	25	25	27	30	29	31	34									
	40	15	17	19	20	22	24	24	26	28	27	29	32									

(Concluded at bottom of next page.)

DOWNES'S TABLE GIVING VALUES OF τ.

FOR COMPUTING THE TIME AND HOUR-ANGLE OF APPARENT CONJUNCTION.

h	Lat. 30°			Lat. 24°			Lat. 18°			Lat. 12°			Lat. 6°			Lat. 0°		
	x'			*x'*			*x'*			*x'*			*x'*			*x'*		
	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50
h m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	6	7	8	7	7	9	7	8	9	7	8	10	7	8	10	8	9	11
20	12	14	16	13	14	18	14	16	19	14	16	20	14	17	21	15	18	21
30	17	20	24	19	22	27	20	24	29	21	25	30	21	25	31	22	26	32
40	23	27	32	25	29	36	26	32	39	28	33	40	28	34	41	29	34	42
50	28	33	40	31	36	44	32	39	48	35	40	50	35	42	51	35	42	52
1 0	33	39	47	36	42	52	38	46	56	40	47	59	41	49	60	41	49	61
10	38	45	54	41	48	59	44	52	63	46	54	67	47	56	68	47	56	69
20	43	50	60	46	54	65	49	58	70	52	60	74	53	62	75	53	63	76
30	48	55	66	51	60	71	54	64	76	57	66	79	58	68	81	59	69	82
40	52	60	71	56	65	77	59	69	82	62	72	84	63	73	87	64	74	88
50	56	64	76	60	69	82	64	74	87	66	77	89	68	78	92	68	79	93
2 0	59	68	80	64	73	86	68	78	91	70	81	95	72	83	97	72	83	98
10	62	72	84	67	77	90	71	81	95	74	85	99	75	87	101	76	87	102
20	65	75	87	70	81	94	74	85	99	77	88	103	78	90	105	79	91	106
30	68	78	90	73	84	97	77	88	102	80	91	106	81	93	108	82	94	109
40	71	81	93	76	87	100	80	91	105	83	94	109	84	96	111	85	97	112
50	74	83	96	78	89	102	82	93	107	85	96	111	87	98	113	87	99	114
3 0	76	85	98	80	91	104	84	95	109	87	98	113	89	100	115	89	101	116
10	77	87	99	82	92	106	86	97	111	89	100	114	91	102	116	91	103	117
20	79	89	101	84	94	107	88	99	112	91	102	115	92	104	118	93	104	118
30	80	90	102	85	95	108	89	100	113	92	103	116	94	105	119	94	105	119
40	81	91	103	86	96	109	90	101	114	93	104	117	95	106	119	95	106	120
50	82	92	104	87	97	110	91	101	114	94	104	118	95	106	120	96	107	120
4 0	83	92	104	88	98	110	92	102	114	94	105	118	96	107	120	97	107	120
10	84	93	104	88	98	110	92	102	114	95	105	118	96	107	120	97	107	120
20	84	93	104	89	98	110	92	102	114	95	105	117	96	107	119	97	107	120
30	84	93	104	89	98	110	92	102	114	95	105	117	96	107	119	97	107	119
40	84	93	104	89	98	109	92	102	113	95	104	116	96	106	118	97	107	119
50	84	93	103	88	97	108	92	101	113	94	104	115	96	106	117	96	106	118
5 0	84	92	102	88	97	108	91	101	112	94	103	114	95	105	116	96	105	117
10	83	92	102	88	96	107	91	100	110	93	102	113	95	104	115	95	104	115
20	83	91	101	87	95	106	90	99	109	92	101	112	94	103	114	94	103	114
30	82	90	100	86	94	104	89	98	108	92	100	111	93	102	112	93	102	113
40	81	89	98	85	93	103	88	97	106	91	99	109	92	100	110			
50	80	88	97	84	92	101	87	95	105	89	97	107						
6 0	79	87	95	83	91	100	86	94	103	88	96	105						
10	78	85	94	82	89	98	84	92	101									
20	77	84	92	80	88	96	82	91	99									
30	75	82	90	79	86	94												
40	74	81	88	77	84	92												
50	72	79	86															
7 0	71	77	84															

(*Concluded from preceding page.*)

h	Lat. 72°			Lat. 66°			Lat. 60°			*h*	Lat. 72°			Lat. 66°			Lat. 60°		
	x'			*x'*			*x'*				*x'*			*x'*			*x'*		
	.62	.56	.50	.62	.56	.50	.62	.56	.50		.62	.56	.50	.62	.56	.50	.62	.56	.50
h m	m	m	m	m	m	m	m	m	m	h m	m	m	m	m	m	m	m	m	m
9 50	14	16	18	18	20	22	22	24	26	11 0	7	8	8	9	10	11	10	11	12
10 0	13	15	16	17	19	21	20	22	24	10	6	6	7	7	8	9	9	9	10
10	12	14	15	16	17	19	19	21	22	20	5	5	6	6	6	7	7	8	8
20	11	12	14	15	16	17	17	19	20	30	3	4	4	4	5	5			
30	10	11	12	13	14	16	16	17	18	40	2	3	3	3	3	4			
40	9	10	11	12	13	14	14	15	16	50	1	1	1	1	2	2			
50	8	9	10	10	11	12	12	13	14	12 0	0	0	0	0	0	0			

FOR WASHINGTON MEAN NOON.

Date.	*k*	*i*	*θ*	*L*	Date.	*k*	*i*	*θ*	*L*
Jan. 1	0.434	97°.6	191°.1	48.9	July 0	0.743	60°.9	6°.8	41.6
6	0.586	80.1	187.5	45.2	5	0.660	71.3	11.3	37.1
11	0.693	67.3	183.6	38.9	10	0.582	80.6	15.2	34.3
16	0.767	57.8	179.3	33.5	15	0.505	89.4	18.6	32.6
21	0.825	49.4	174.7	29.9	20	0.427	98.4	21.6	31.3
26	0.869	42.5	169.8	27.6	25	0.343	108.3	24.5	29.6
31	0.903	36.2	164.7	26.5	30	0.252	119.7	27.9	26.4
Feb. 5	0.932	30.3	159.3	26.6	Aug. 4	0.156	133.5	32.7	20.1
10	0.957	23.9	153.2	27.1	9	0.068	149.7	42.0	10.6
15	0.978	17.1	145.0	30.4	14	0.015	166.1	77.1	2.6
20	0.996	7.4	127.4	34.8	19	0.027	161.0	164.5	5.0
25	0.998	5.5	40.6	41.3	24	0.122	139.1	186.8	21.2
Mar. 2	0.980	16.1	350.3	50.7	29	0.292	114.6	194.6	44.4
7	0.922	32.5	339.6	61.6	Sept. 3	0.505	89.4	199.8	63.4
12	0.801	53.0	335.1	69.8	8	0.712	64.9	204.9	70.1
17	0.619	76.3	332.5	68.4	13	0.866	43.0	209.8	64.3
22	0.411	100.3	330.4	55.0	18	0.958	24.1	215.8	53.6
27	0.224	123.5	327.7	35.1	23	0.991	11.0	227.5	43.2
Apr. 1	0.085	146.1	322.5	15.0	28	0.999	3.3	312.5	35.7
6	0.012	167.3	303.1	2.3	Oct. 3	0.992	10.2	12.0	30.6
11	0.009	169.0	178.9	1.7	8	0.978	17.3	19.8	27.5
16	0.062	151.1	158.8	10.0	13	0.956	23.8	22.1	25.9
21	0.140	135.2	154.3	19.0	18	0.933	29.9	22.4	25.5
26	0.236	121.8	152.5	26.4	23	0.903	36.3	21.8	26.1
May 1	0.326	110.4	151.8	30.4	28	0.865	43.0	20.4	27.9
6	0.411	100.3	151.7	32.6	Nov. 2	0.817	50.7	18.5	30.2
11	0.493	90.8	152.2	34.7	7	0.750	60.0	16.3	35.8
16	0.578	81.0	153.3	37.4	12	0.655	71.9	13.9	41.8
21	0.666	70.6	155.2	41.4	17	0.521	87.6	11.7	47.7
26	0.763	58.2	158.0	47.4	22	0.337	109.0	9.8	46.5
31	0.863	43.5	162.2	55.2	27	0.129	137.9	7.7	26.3
June 5	0.951	25.7	169.2	63.2	Dec. 2	0.004	173.1	348.7	0.9
10	0.997	6.1	196.7	67.4	7	0.074	148.5	203.7	17.1
15	0.982	15.2	342.1	64.5	12	0.285	115.4	199.9	47.0
20	0.917	33.4	354.2	56.5	17	0.490	91.1	197.1	53.2
25	0.832	48.4	1.2	48.2	22	0.642	73.5	193.8	47.2
30	0.743	60.9	6.8	41.6	27	0.755	59.3	190.0	40.1
					32	0.820	50.2	185.7	33.8

NOTATION.

k, the ratio of the illuminated portion of the apparent disk to the entire apparent disk considored as the superficies of a circle.

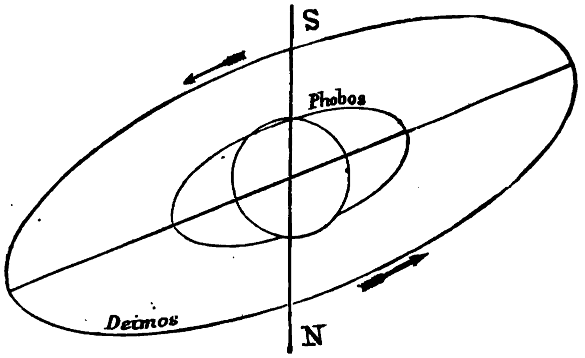
i, the angle between the sun and earth, as seen from the planet.

θ, the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L, the brilliancy of the disk. The unit of *L* is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the sun, and illuminated by the latter as the mean disk of the planet is illuminated.

FOR WASHINGTON MEAN NOON.

Date	k	i	θ	L	Date.	k	i	θ	L
Jan. 1	0.361	106°.1	340°.5	204.6	June 5	0.662	71°.1	157°.5	94.8
6	0.324	110.6	339.1	213.3	10	0.681	68.8	158.7	90.5
11	0.285	115.5	337.6	218.3	15	0.699	66.5	160.0	86.6
16	0.243	121.0	335.9	217.9	20	0.717	64.3	161.6	83.0
21	0.198	127.1	333.8	208.7	25	0.734	62.1	163.5	79.7
23	0.180	129.8	332.9	200.8	30	0.750	59.9	165.5	76.8
25	0.161	132.7	331.8	192.4	July 5	0.767	57.8	167.8	74.1
27	0.143	135.6	330.5	181.4	10	0.782	55.7	170.2	71.7
29	0.125	138.7	329.1	168.1	15	0.797	53.6	172.8	69.5
31	0.106	141.9	327.3	151.7	20	0.811	51.5	175.5	67.5
Feb. 2	0.089	145.2	325.2	134.3	25	0.825	49.4	178.3	65.6
4	0.073	148.7	322.6	115.1	30	0.839	47.3	181.2	63.9
6	0.058	152.2	319.2	95.3	Aug. 4	0.852	45.2	184.1	62.4
8	0.044	155.7	314.9	76.0	9	0.864	43.2	186.9	61.0
10	0.032	159.2	308.8	57.8	14	0.876	41.2	189.8	59.7
12	0.023	162.6	300.7	42.0	19	0.888	39.2	192.5	58.5
14	0.016	165.4	289.8	29.7	24	0.898	37.2	195.2	57.4
16	0.012	167.4	271.7	22.5	29	0.909	35.2	197.5	56.4
18	0.011	168.1	250.9	20.1	Sept. 3	0.919	33.2	199.6	55.5
20	0.012	167.3	230.3	22.7	8	0.928	31.2	201.9	54.6
22	0.017	165.1	214.9	30.8	13	0.936	29.2	203.8	53.8
24	0.024	162.2	202.6	42.9	18	0.944	27.3	205.3	53.1
26	0.034	158.9	194.6	58.1	23	0.952	25.4	206.7	52.4
28	0.045	155.4	188.8	75.4	28	0.959	23.5	207.9	51.7
Mar. 2	0.059	152.0	184.6	93.7	Oct. 3	0.965	21.6	208.6	51.1
7	0.098	143.4	177.5	137.6	8	0.971	19.7	209.4	50.6
12	0.142	135.6	172.8	171.2	13	0.976	17.8	209.8	50.1
17	0.188	128.6	169.8	191.9	18	0.981	15.9	209.9	49.7
22	0.232	122.4	167.2	200.9	23	0.985	14.1	209.8	49.2
27	0.275	116.8	165.1	201.6	28	0.989	12.3	209.3	48.8
Apr. 1	0.314	111.8	163.2	197.8	Nov. 2	0.992	10.5	208.6	48.5
6	0.351	107.3	161.5	188.8	7	0.994	8.8	207.8	48.2
11	0.386	103.2	160.0	179.2	12	0.996	7.0	206.9	48.0
16	0.419	99.4	158.7	169.2	17	0.998	5.2	205.5	47.8
21	0.449	95.9	157.6	166.4	22	0.999	3.6	204.4	47.6
26	0.478	92.6	156.7	149.4	27	1.000	1.9	204.4	47.4
May 1	0.505	89.4	156.0	140.4	Dec. 2	1.000	0.2	232.1	47.3
6	0.530	86.5	155.6	132.5	7	1.000	1.4	9.1	47.3
11	0.555	83.7	155.3	124.3	12	0.999	3.1	9.5	47.3
16	0.578	81.1	155.3	117.0	17	0.998	4.8	7.7	47.3
21	0.600	78.5	155.5	110.7	22	0.996	6.5	5.4	47.4
26	0.621	76.0	155.9	104.8	27	0.995	8.1	2.7	47.5
31	0.642	73.5	156.6	99.6	32	0.993	9.7	0.1	47.7
36	0.662	71.1	157.5	94.8	37	0.990	11.3	357.4	47.9



APPARENT ORBITS OF THE SATELLITES OF MARS IN FEBRUARY AND MARCH, 1886, AS SEEN IN AN INVERTING TELESCOPE.

The circle represents the disk of the planet, and is on the same scale as the orbits. The mean motions of the satellites are not yet (February, 1883) sufficiently well established to enable the times of greatest elongation to be very accurately predicted.

WASHINGTON MEAN TIMES OF ELONGATION.

PHOBOS.									DEIMOS.					
	d	h		d	h		d	h		d	h		d	h
Feb.	11	8.31 E.	Feb.	26	23.23 E.	Mar.	14	14.15 E.	Feb.	10	11.79 E.	Mar.	7	1.81 W.
	12	11.09 W.	Mar.	0	2.00 W.		15	16.93 W.		12	9.20 W.		8	23.17 E.
	13	13.87 E.		1	4.78 E.		16	19.71 E.		14	6.56 E.		10	20.58 W.
	14	16.65 W.		2	7.56 W.		17	22.49 W.		16	3.97 W.		12	17.94 E.
	15	19.43 E.		3	10.34 E.		19	1.27 E.		18	1.33 E.		14	15.35 W.
	16	22.21 W.		4	13.12 W.		20	4.05 W.		19	22.74 W.		16	12.71 E.
	18	0.99 E.		5	15.90 E.		21	6.83 E.		21	20.10 E.		18	10.12 W.
	19	3.77 W.		6	18.69 W.		22	9.61 W.		23	17.50 W.		20	7.48 E.
	20	6.55 E.		7	21.47 E.		23	12.39 E.		25	14.86 E.		22	4.89 W.
	21	9.33 W.		9	0.25 W.		24	15.17 W.		27	12.27 W.		24	2.25 E.
	22	12.11 E.		10	3.03 E.		25	17.95 E.	Mar.	1	9.63 E.		25	23.66 W.
	23	14.89 W.		11	5.81 W.		26	20.73 W.		3	7.04 W.		27	21.02 E.
	24	17.67 E.		12	8.59 E.		27	23.51 E.		5	4.40 E.		29	18.43 W.
	25	20.45 W.		13	11.37 W.		29	2.30 W.						

Date.			Position Angle.	Distance.	Date.			Position Angle.	Distance.
	d	h	°	″		d	h	°	″
Feb.	11	8.31	113.2	18.0	Feb.	10	11.79	111.4	45.5
Mar.	6	18.69	289.5	19.3	Mar.	7	1.81	288.9	48.3
	29	2.30	285.2	18.3		29	18.43	285.1	46.7

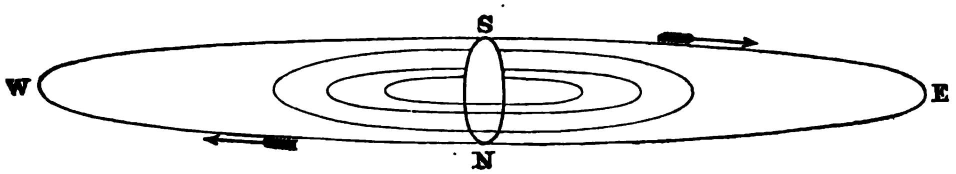
For Phobos every seventh eastern and western elongation is given, and for Deimos every third; the intermediate ones may be found with sufficient accuracy by adding the periodic time of each satellite.

Periodic time of Phobos, $0^d\ 7^h\ 39^m\ 13^s.937$. Periodic time of Deimos, $1^d\ 6^h\ 17^m\ 54^s.377$.

APPARENT DISK OF MARS.

January	15,	0.931	May	15,	0.901	September	15,	0.919
February	15,	0.983	June	15,	0.885	October	15,	0.936
March	15,	0.996	July	15,	0.888	November	15,	0.954
April	15,	0.943	August	15,	0.900	December	15,	0.969

The numbers in this table are the versed sines of the illuminated disk, the apparent diameter of the planet being taken as unity.



APPARENT ORBITS OF THE SATELLITES OF JUPITER IN 1886,
AS SEEN IN AN INVERTING TELESCOPE.

(*The vertical scale is five times the horizontal one.*)

The object of this figure is to facilitate the identification of the satellites in cases where the diagrams of configurations do not suffice for that purpose: reference to the above diagram enables one to identify the inner and outer satellite of the pair. The central, vertical ellipse represents the disk of Jupiter, elongated five times in the vertical direction to correspond to the representation of the orbits of the satellites.

Facing each page of the phenomena of Jupiter's satellites, pages 456—476, is the page of diagrams of configurations, for the same month. The light disks ○ in the vertical row in the middle of the page represent the relative position of Jupiter each day. The dots adjacent in the same horizontal space represent the positions of the several satellites on the same day, at the hour and minute of Washington mean time indicated above the diagrams. The latitudes of the satellites are always considered zero in constructing the diagrams, except where two or more satellites chance to be at nearly the same distance from the planet, when they are placed one above the other according to their apparent latitudes. The numerals designating the satellites are placed on the right or left hand side of the dot, according as the motion of the satellite, for the time of the configuration, is toward the east or toward the west—the motion being always toward the numeral. Frequently, at the epoch of the configuration, one or more satellites will be invisible, being projected on the disk of the planet: this phenomenon is indicated by a light disk ○ at the left hand side of the page. Frequently, also, one or more satellites will be invisible, being concealed in occultation behind the disk, or eclipsed in the shadow of the planet: this phenomenon is indicated by a dark disk ● at the right hand side of the page. In both cases, the annexed numeral serves to point out which satellite is thus rendered invisible.

When an observation is made at a different hour from that for which the diagram is constructed, the motion of the satellite during the interval may be judged by transferring its given position to the above diagram, and estimating its motion during the elapsed interval on the above diagram of the orbits, by means of the following table of the periods:—

MEAN SYNODIC PERIODS OF THE SATELLITES.

	d	h	m	s		d
I.	1	18	28	35.945	=	1.76986048
II.	3	13	17	53.735	=	3.55409416
III.	7	3	59	35.854	=	7.16638720
IV.	16	18	5	6.928	=	16.75355241

WASHINGTON MEAN-TIMES OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE I.

		h	m			h	m			h	m			h	m
Jan.	0	5	18.3	Mar.	20	19	18.5	June	8	9	28.9	Aug.	27	1	35.1
	1	23	46.3		22	13	44.3		10	3	57.3		28	20	5.3
	3	18	14.2		24	8	10.1		11	22	25.8		30	14	35.5
	5	12	42.2		26	2	36.0		13	16	54.3	Sept.	1	9	5.8
	7	7	9.9		27	21	1.9		15	11	22.8		3	3	36.1
	9	1	37.7		29	15	27.9		17	5	51.5		4	22	6.4
	10	20	5.4		31	9	53.8		19	0	20.3		6	16	36.6
	12	14	33.0	Apr.	2	4	19.8		20	18	49.0		8	11	6.9
	14	9	0.5		3	22	45.8		22	13	17.9		10	5	37.2
	16	3	28.0		5	17	11.9		24	7	46.8				
	17	21	55.4		7	11	37.9		26	2	15.8				
	19	16	22.8		9	6	4.0		27	20	44.7				
	21	10	50.0		11	0	30.3		29	15	13.8				
	23	5	17.3		12	18	56.5	July	1	9	42.9	Nov.	7	16	17.3
	24	23	44.4		14	13	22.7		3	4	12.0		9	10	47.4
	26	18	11.3		16	7	49.0		4	22	41.2		11	5	17.6
	28	12	38.3		18	2	15.4		6	17	10.5		12	23	47.6
	30	7	5.1		19	20	41.9		8	11	39.8		14	18	17.8
Feb.	1	1	32.0		21	15	8.3		10	6	9.2		16	12	47.8
	2	19	58.8		23	9	34.8		12	0	38.6		18	7	17.8
	4	14	25.6		25	4	1.4		13	19	8.1		20	1	47.8
	6	8	52.2		26	22	28.1		15	13	37.5		21	20	17.9
	8	3	18.7		28	16	54.9		17	8	7.1		23	14	47.8
	9	21	45.3		30	11	21.7		19	2	36.6		25	9	17.8
	11	16	11.8	May	2	5	48.5		20	21	6.2		27	3	47.7
	13	10	38.2		4	0	15.5		22	15	35.8		28	22	17.5
	15	5	4.5		5	18	42.5		24	10	5.6		30	16	47.3
	16	23	30.8		7	13	9.5		26	4	35.2	Dec.	2	11	17.1
	18	17	57.1		9	7	36.6		27	23	5.0		4	5	46.9
	20	12	23.3		11	2	3.9		29	17	34.8		6	0	16.7
	22	6	49.4		12	20	31.2		31	12	4.6		7	18	46.4
	24	1	15.5		14	14	58.5	Aug.	2	6	34.4		9	13	16.1
	25	19	41.6		16	9	25.9		4	1	4.4		11	7	45.6
	27	14	7.7		18	3	53.4		5	19	34.2		13	2	15.1
Mar.	1	8	33.7		19	22	20.9		7	14	4.2		14	20	44.6
	3	2	59.7		21	16	48.6		9	8	34.0		16	15	14.2
	4	21	25.6		23	11	16.3		11	3	4.1		18	9	43.6
	6	15	51.6		25	5	44.1		12	21	34.0		20	4	13.0
	8	10	17.4		27	0	12.0		14	16	4.1		21	22	42.3
	10	4	43.3		28	18	39.9		16	10	34.1		23	17	11.7
	11	23	9.2		30	13	7.8		18	5	4.3		25	11	41.0
	13	17	35.0	June	1	7	36.0		19	23	34.3		27	6	10.3
	15	12	1.0		3	2	4.1		21	18	4.5		29	0	39.4
	17	6	26.8		4	20	32.3		23	12	34.7		30	19	8.6
	19	0	52.6		6	15	0.6		25	7	4.9		32	13	37.6

WASHINGTON MEAN TIMES OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE II.

		h	m			h	m			h	m			h	m
Jan.	3	12	11.8	Mar.	26	3	20.5	June	15	19	6.1	Sept.	5	14	21.9
	7	1	27.4		29	16	28.9		19	8	24.2		9	3	45.5
	10	14	43.3	Apr.	2	5	36.5		22	21	43.2				
	14	3	57.9		5	18	45.4		26	11	2.1				
	17	17	12.8		9	7	53.5		30	0	21.9	Nov.	5	2	4.5
	21	6	26.3		12	21	3.0	July	3	13	41.5		8	15	27.7
	24	19	40.0		16	10	11.7		7	3	1.9		12	4	50.8
	28	8	52.2		19	23	21.9		10	16	22.2		15	18	13.7
	31	22	4.8		23	12	31.6		14	5	43.3		19	7	36.4
Feb.	4	11	16.0		27	1	42.6		17	19	4.3		22	20	58.9
	8	0	27.6		30	14	53.1		21	8	25.8		26	10	21.4
	11	13	37.8	May	4	4	5.2		24	21	47.3		29	23	43.6
	15	2	48.5		7	17	16.9		28	11	9.3	Dec.	3	13	5.6
	18	15	57.8		11	6	30.1	Aug.	1	0	31.4		7	2	27.3
	22	5	7.6		14	19	42.9		4	13	53.9		10	15	49.0
	25	18	16.1		18	8	57.2		8	3	16.4		14	5	10.2
Mar.	1	7	25.2		21	22	11.2		11	16	39.1		17	18	31.3
	4	20	33.1		25	11	26.5		15	6	2.0		21	7	52.0
	8	9	41.7		29	0	41.5		18	19	25.1		24	21	12.5
	11	22	49.2	June	1	13	57.7		22	8	48.3		28	10	32.6
	15	11	57.5		5	3	13.7		25	22	11.6		31	23	52.4
	19	1	4.8		8	16	29.8		29	11	34.9		35	13	12.5
	22	14	13.1		12	5	47.9	Sept.	2	0	58.3				

SATELLITE III.

		h	m			h	m			h	m			h	m
Jan.	4	19	44.6	Mar.	31	13	17.9	June	25	8	56.1	Nov.	8	19	36.6
	11	23	33.1	Apr.	7	16	36.3	July	2	13	1.0		16	0	0.9
	19	3	17.0		14	19	56.5		9	17	8.8		23	4	24.1
	26	6	56.2		21	23	19.6		16	21	20.0		30	8	45.8
Feb.	2	10	31.5		29	2	46.2		24	1	33.4	Dec.	7	13	5.5
	9	14	2.1	May	6	6	17.0		31	5	49.1		14	17	23.2
	16	17	29.1		13	9	52.8	Aug.	7	10	7.0		21	21	38.0
	23	20	51.8		20	13	32.7		14	14	27.0		29	1	49.9
Mar.	3	0	11.5		27	17	17.3		21	18	49.1		36	5	59.0
	10	3	28.9	June	3	21	5.8		28	23	12.9				
	17	6	45.0		11	0	58.5	Sept.	5	3	37.9				
	24	10	1.0		18	4	55.4		12	8	3.4				

SATELLITE IV.

		h	m			h	m			h	m			h	m
Jan.	3	18	18.7	Apr.	13	13	11.2	July	22	19	47.4	Oct.	31	21	28.7
	20	11	14.9		30	4	8.5	Aug.	8	15	26.0	Nov.	17	17	51.9
Feb.	6	3	11.8	May	16	19	55.6		25	11	28.8	Dec.	4	13	57.0
	22	18	15.7	June	2	12	38.6	Sept.	11	7	49.6		21	9	36.4
Mar.	11	8	40.9		19	6	16.4						38	[4	42.1]
	27	22	50.3	July	6	0	41.6								

WASHINGTON MEAN TIME.

JANUARY.

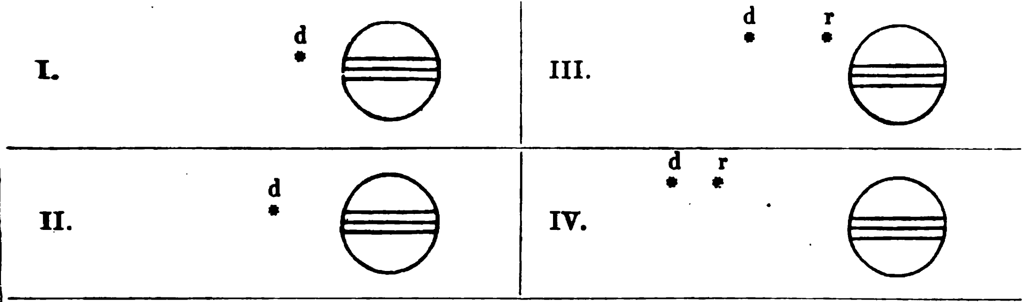
d	h	m	s			
1	0	5		I.	Sh.	In.
	1	19		I.	Tr.	In.
	2	15		III.	Sh.	Eg.
	2	22		I.	Sh.	Eg.
	3	35		I.	Tr.	Eg.
	4	10		III.	Tr.	In.
	7	1		III.	Tr.	Eg.
	14	5		II. *	Sh.	In.
	16	36		II. *	Tr.	In.
	16	56		II. *	Sh.	Eg.
	19	22		II.	Tr.	Eg.
	21	27	8.8	I.	Ec.	Dis.
2	0	54		I.	Oc.	Re.
	18	34		I. *	Sh.	In.
	19	47		I.	Tr.	In.
	20	51		I.	Sh.	Eg.
	22	2		I.	Tr.	Eg.
3	5	28	17.5	IV.	Ec.	Dis.
	8	4	17.7	IV.	Ec.	Re.
	8	20	58.2	II.	Ec.	Dis.
	13	35		II. *	Oc.	Re.
	15	55	22.3	I. *	Ec.	Dis.
	18	10		IV. *	Oc.	Dis.
	18	27		IV. *	Oc.	Re.
	19	22		I.	Oc.	Re.
4	13	2		I. *	Sh.	In.
	13	20	55.2	III. *	Ec.	Dis.
	14	15		I. *	Tr.	In.
	15	19		I. *	Sh.	Eg.
	16	20	1.4	III. *	Ec.	Re.
	16	30		I. *	Tr.	Eg.
	18	20		III. *	Oc.	Dis.
	21	10		III.	Oc.	Re.
5	3	22		II.	Sh.	In.
	5	51		II.	Tr.	In.
	6	12		II.	Sh.	Eg.
	8	37		II.	Tr.	Eg.
	10	23	37.8	I.	Ec.	Dis.
	13	50		I. *	Oc.	Re.
6	7	31		I.	Sh.	In.
	8	43		I.	Tr.	In.
	9	48		I.	Sh.	Eg.
	10	58		I.	Tr.	Eg.
	21	38	3.0	II.	Ec.	Dis.
7	2	50		II.	Oc.	Re.
	4	51	51.1	I.	Ec.	Dis.
	8	18		I.	Oc.	Re.
8	1	59		I.	Sh.	In.
	3	2		III.	Sh.	In.
	3	11		I.	Tr.	In.
	4	16		I.	Sh.	Eg.
	5	26		I.	Tr.	Eg.
	6	12		III.	Sh.	Eg.
	8	3		III.	Tr.	In.
	10	51		III.	Tr.	Eg.
	16	39		II. *	Sh.	In.
	19	6		II.	Tr.	In.
	19	29		I.	Sh.	Eg.
	21	52		II.	Tr.	Eg.
	23	20	8.7	I.	Ec.	Dis.
9	2	45		I.	Oc.	Re.
	20	27		I.	Sh.	In.
	21	39		I.	Tr.	In.
	22	44		I.	Sh.	Eg.
	23	54		I.	Tr.	Eg.
10	10	55	57.4	II.	Ec.	Dis.
	16	6		II. *	Oc.	Re.
	17	48	22.1	I. *	Ec.	Dis.
	21	13		I.	Oc.	Re.
11	12	30		IV. *	Sh.	In.
	14	55		I. *	Sh.	In.
	15	23		IV. *	Sh.	Eg.
	16	7		I. *	Tr.	In.
	17	12		I. *	Sh.	Eg.
	17	18	12.6	III. *	Ec.	Dis.
	18	22		I. *	Tr.	Eg.
	20	16	22.0	III.	Ec.	Re.
	22	10		III.	Oc.	Dis.
12	0	57		III.	Oc.	Re.
	5	55		II.	Sh.	In.
	8	20		II.	Tr.	In.
	8	45		II.	Sh.	Eg.
	11	6		II.	Tr.	Eg.
	12	16	37.6	I. *	Ec.	Dis.
	15	41		I. *	Oc.	Re.
13	9	23		I.	Sh.	In.
	10	35		I.	Tr.	In.
	11	40		I. *	Sh.	Eg.
	12	50		I. *	Tr.	Eg.
14	0	13	5.1	II.	Ec.	Dis.
	5	21		II.	Oc.	Re.
	6	44	50.8	I.	Ec.	Dis.
	10	8		I.	Oc.	Re.
15	3	51		I.	Sh.	In.
	5	2		I.	Tr.	In.
	6	8		I.	Sh.	Eg.
	7	0		III.	Sh.	In.
	7	17		I.	Tr.	Eg.
	10	9		III.	Sh.	Eg.
	11	51		III. *	Tr.	In.
	14	37		III. *	Tr.	Eg.
	19	12		II.	Sh.	In.
	21	34		II.	Tr.	In.
	22	2		II.	Sh.	Eg.
16	0	19		II.	Tr.	Eg.
	1	13	8.3	I.	Ec.	Dis.
	4	36		I.	Oc.	Re.
	22	19		I.	Sh.	In.
	23	29		I.	Tr.	In.
17	0	36		I.	Sh.	Eg.
	1	44		I.	Tr.	Eg.
	13	31	6.5	II. *	Ec.	Dis.
	18	35		II.	Oc.	Re.
	19	41	22.3	I.	Ec.	Dis.
	23	3		I.	Oc.	Re.
18	16	48		I. *	Sh.	In.
	17	56		I. *	Tr.	In.
	19	5		I.	Sh.	Eg.
	20	11		I.	Tr.	Eg.
	21	15	27.7	III.	Ec.	Dis.
19	0	12	39.1	III.	Ec.	Re.
	1	55		III.	Oc.	Dis.
	4	39		III.	Oc.	Re.
	8	28		II.	Sh.	In.
	10	47		II.	Tr.	In.
	11	18		II. *	Sh.	Eg.
	13	32		II. *	Tr.	Eg.
	14	9	37.7	I. *	Ec.	Dis.
	17	30		I. *	Oc.	Re.
	23	29	19.1	IV.	Ec.	Dis.
20	1	54	1.3	IV.	Ec.	Re.
	11	16		I. *	Sh.	In.
	12	24		I. *	Tr.	In.
	13	33		I. *	Sh.	Eg.
	14	39		I. *	Tr.	Eg.
21	2	48	17.6	II.	Ec.	Dis.
	7	49		II.	Oc.	Re.
	8	37	51.4	I.	Ec.	Dis.
21	11	57		I. *	Oc.	Re.
22	5	45		I.	Sh.	In.
	6	51		I.	Tr.	In.
	8	2		I.	Sh.	Eg.
	9	6		I.	Tr.	Eg.
	10	58		III. *	Sh.	In.
	14	6		III. *	Sh.	Eg.
	15	34		III. *	Tr.	In.
	18	18		III. *	Tr.	Eg.
	21	45		II.	Sh.	In.
23	0	0		II.	Tr.	In.
	0	35		II.	Sh.	Eg.
	2	45		II.	Tr.	Eg.
	3	6	9.0	I.	Ec.	Dis.
	6	25		I.	Oc.	Re.
24	0	13		I.	Sh.	In.
	1	18		I.	Tr.	In.
	2	30		I.	Sh.	Eg.
	3	33		I.	Tr.	Eg.
	16	6	25.8	II. *	Ec.	Dis.
	21	2		II.	Oc.	Re.
	21	34	23.4	I.	Ec.	Dis.
25	0	52		I.	Oc.	Re.
	18	42		I.	Sh.	In.
	19	46		I.	Tr.	In.
	20	59		I.	Sh.	Eg.
	22	1		I.	Tr.	Eg.
26	1	12	53.2	III.	Ec.	Dis.
	4	9	5.0	III.	Ec.	Re.
	5	34		III.	Oc.	Dis.
	8	18		III.	Oc.	Re.
	11	1		II. *	Sh.	In.
	13	12		II. *	Tr.	In.
	13	51		II. *	Sh.	Eg.
	15	57		II. *	Tr.	Eg.
	16	2	38.9	I. *	Ec.	Dis.
	19	19		I.	Oc.	Re.
27	13	10		I. *	Sh.	In.
	14	13		I. *	Tr.	In.
	15	27		I. *	Sh.	Eg.
	16	28		I. *	Tr.	Eg.
28	5	23	40.9	II.	Ec.	Dis.
	6	30		IV.	Sh.	In.
	9	12		IV.	Sh.	Eg.
	10	14		II.	Oc.	Re.
	10	30	53.3	I. *	Ec.	Dis.
	13	46		I. *	Oc.	Re.
29	7	38		I.	Sh.	In.
	8	40		I.	Tr.	In.
	9	55		I.	Sh.	Eg.
	10	55		I. *	Tr.	Eg.
	14	56		III. *	Sh.	In.
	18	3		III. *	Sh.	Eg.
	19	12		III.	Tr.	In.
	21	55		III.	Tr.	Eg.
30	0	18		II.	Sh.	In.
	2	23		II.	Tr.	In.
	3	8		II.	Sh.	Eg.
	4	59	11.1	I.	Ec.	Dis.
	5	8		II.	Tr.	Eg.
	8	13		I.	Oc.	Re.
31	2	7		I.	Sh.	In.
	3	7		I.	Tr.	In.
	4	24		I.	Sh.	Eg.
	5	22		I.	Tr.	Eg.
	18	41	55.8	II.	Ec.	Dis.
	23	27		II.	Oc.	Re.
	23	27	26.4	I.	Ec.	Dis.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

JANUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 15h 0m for an Inverting Telescope.

Day.	West.		East.
1	·4 ·1 3 2	○	·
2	3· ·4 ·2	○	1·
3	·3 ·1 ·	○	4 ·2
4	○ 1· ·3	○	2· ·4
5	2·	○	·1 ·3 ·4
6	·2 1·	○	3· ·4
7		○	·1 2 3· ·4
8	·1 3·	○	2· 4·
9	3· 2·	○	1· 4·
10	·3 ·1	○	4· ·2 ●
11	·3	○	1· 4· 2·
12	4· 2·	○	·3 ·1 ●
13	4· ·2 1·	○	·3
14	4·	○	·1 ·2 3·
15	4· 1· 3·	○	2·
16	·4 3· 2·	○	1·
17	·4 ·3 ·1 ·2	○	
18	·4 ·3	○	1· 2·
19	·4 2· ·	○	1 ·3
20	·2 1·	○	·4 ·3
21		○	·1 ·2 ·4 3·
22	1· 3	○	· 2· ·4
23	3· 2·	○	·1 ·4
24	·3 ·1 ·2	○	·4
25	·3	○	1· ·2 4·
26	○ 2· ·1	○	·3 4·
27	○ 1· ·2	○	4· ·3
28		○	·1 4· ·2 3·
29	4· 1.	○	3· 2·
30	4· 3· 2·	○	·1
31	4· 3· ·1 ·2	○	

WASHINGTON MEAN TIME.

FEBRUARY.

d	h	m	s			
1	2	39		I.	Oc.	Re.
	20	35		I.	Sh.	In.
	21	34		I.	Tr.	In.
	22	52		I.	Sh.	Eg.
	23	49		I.	Tr.	Eg.
2	5	10	56.6	III.	Ec.	Dis.
	8	6	8.0	III.	Ec.	Re.
	9	10		III.	Oc.	Dis.
	11	53		III.*	Oc.	Re.
	13	34		II.*	Sh.	In.
	15	34		II.*	Tr.	In.
	16	24		II.*	Sh.	Eg.
	17	55	42.5	I.*	Ec.	Dis.
	18	19		II.*	Tr.	Eg.
	21	6		I.	Oc.	Re.
3	15	3		I.*	Sh.	In.
	16	1		I.*	Tr.	In.
	17	20		I.*	Sh.	Eg.
	18	16		I.	Tr.	Eg.
4	7	59	15.1	II.	Ec.	Dis.
	12	23	57.3	I.*	Ec.	Dis.
	12	38		II.*	Oc.	Re.
	15	33		I.*	Oc.	Re.
5	9	32		I.	Sh.	In.
	10	28		I.*	Tr.	In.
	11	49		I.*	Sh.	Eg.
	12	43		I.*	Tr.	Eg.
	17	30	21.5	IV.*	Ec.	Dis.
	18	54		III.	Sh.	In.
	19	42	42.3	IV.	Ec.	Re.
	22	0		III.	Sh.	Eg.
	22	46		III.	Tr.	In.
6	1	27		III.	Tr.	Eg.
	2	51		II.	Sh.	In.
	4	44		II.	Tr.	In.
	5	41		II.	Sh.	Eg.
	6	52	15.8	I.	Ec.	Dis.
	7	29		II.	Tr.	Eg.
	10	0		I.*	Oc.	Re.
7	4	0		I.	Sh.	In.
	4	54		I.	Tr.	In.
	6	17		I.	Sh.	Eg.
	7	9		I.	Tr.	Eg.
	21	17	36.9	II.	Ec.	Dis.
8	1	20	32.0	I.	Ec.	Dis.
	1	50		II.	Oc.	Re.
	4	26		I.	Oc.	Re.
	22	29		I.	Sh.	In.
	23	21		I.	Tr.	In.
9	0	45		I.	Sh.	Eg.
	1	36		I.	Tr.	Eg.
	9	8	43.8	III.	Ec.	Dis.
	12	2	55.0	III.*	Ec.	Re.
	12	42		III.*	Oc.	Dis.
	15	23		III.*	Oc.	Re.
	16	7		II.*	Sh.	In.
	17	54		II.*	Tr.	In.
	18	57		II.	Sh.	Eg.
	19	48	49.1	I.	Ec.	Dis.
9	20	39		II.	Tr.	Eg.
	22	53		I.	Oc.	Re.
10	16	57		I.*	Sh.	In.
	17	48		I.*	Tr.	In.
	19	14		I.	Sh.	Eg.
	20	2		I.	Tr.	Eg.
11	10	35	0.4	II.*	Ec.	Dis.
	14	17	5.1	I.*	Ec.	Dis.
	15	0		II.*	Oc.	Re.
	17	19		I.*	Oc.	Re.
12	11	26		I.*	Sh.	In.
	12	14		I.*	Tr.	In.
	13	42		I.*	Sh.	Eg.
	14	29		I.*	Tr.	Eg.
	22	52		III.	Sh.	In.
13	1	56		III.	Sh.	Eg.
	2	15		III.	Tr.	In.
	4	55		III.	Tr.	Eg.
	5	24		II.	Sh.	In.
	7	3		II.	Tr.	In.
	8	14		II.	Sh.	Eg.
	8	45	24.4	I.	Ec.	Dis.
	9	48		II.*	Tr.	Eg.
	11	46		I.*	Oc.	Re.
14	0	32		IV.	Sh.	In.
	3	1		IV.	Sh.	Eg.
	5	54		I.	Sh.	In.
	6	41		I.	Tr.	In.
	8	10		I.	Sh.	Eg.
	8	55		I.	Tr.	Eg.
	23	53	28.7	II.	Ec.	Dis.
15	3	13	41.9	I.	Ec.	Dis.
	4	11		II.	Oc.	Re.
	6	12		I.	Oc.	Re.
16	0	23		I.	Sh.	In.
	1	8		I.	Tr.	In.
	2	39		I.	Sh.	Eg.
	3	22		I.	Tr.	Eg.
	13	6	59.1	III.*	Ec.	Dis.
	16	0	9.9	III.*	Ec.	Re.
	16	9		III.*	Oc.	Dis.
	18	41		II.	Sh.	In.
	18	49		III.	Oc.	Re.
	20	12		II.	Tr.	In.
	21	30		II.	Sh.	Eg.
	21	41	59.7	I.	Ec.	Dis.
	22	56		II.	Tr.	Eg.
17	0	38		I.	Oc.	Re.
	18	51		I.	Sh.	In.
	19	35		I.	Tr.	In.
	21	7		I.	Sh.	Eg.
	21	49		I.	Tr.	Eg.
18	13	10	56.2	II.*	Ec.	Dis.
	16	10	17.2	I.*	Ec.	Dis.
	17	20		II.*	Oc.	Re.
	19	4		I.	Oc.	Re.
19	13	19		I.*	Sh.	In.
	14	1		I.*	Tr.	In.
	15	36		I.*	Sh.	Eg.
19	16	15		I.*	Tr.	Eg.
20	2	50		III.	Sh.	In.
	5	40		III.	Tr.	In.
	5	53		III.	Sh.	Eg.
	7	58		II.	Sh.	In.
	8	20		III.	Tr.	Eg.
	9	20		II.*	Tr.	In.
	10	38	37.4	I.*	Ec.	Dis.
	10	47		II.*	Sh.	Eg.
	12	4		II.*	Tr.	Eg.
	13	31		I.*	Oc.	Re.
21	7	48		I.	Sh.	In.
	8	27		I.	Tr.	In.
	10	4		I.*	Sh.	Eg.
	10	41		I.*	Tr.	Eg.
22	2	29	30.1	II.	Ec.	Dis.
	5	6	56.4	I.	Ec.	Dis.
	6	29		II.	Oc.	Re.
	7	57		I.	Oc.	Re.
	11	32	31.1	IV.*	Ec.	Dis.
	13	31	7.9	IV.*	Ec.	Re.
23	2	16		I.	Sh.	In.
	2	53		I.	Tr.	In.
	4	33		I.	Sh.	Eg.
	5	8		I.	Tr.	Eg.
	17	4	43.6	III.*	Ec.	Dis.
	21	14		II.	Sh.	In.
	22	12		III.	Oc.	Re.
	22	28		II.	Tr.	In.
	23	35	15.5	I.	Ec.	Dis.
24	0	3		II.	Sh.	Eg.
	1	12		II.	Tr.	Eg.
	2	23		I.	Oc.	Re.
	20	44		I.	Sh.	In.
	21	19		I.	Tr.	In.
	23	1		I.	Sh.	Eg.
	23	34		I.	Tr.	Eg.
25	15	47	3.6	II.*	Ec.	Dis.
	18	3	34.5	I.	Ec.	Dis.
	19	38		II.	Oc.	Re.
	20	49		I.	Oc.	Re.
26	15	13		I.*	Sh.	In.
	15	45		I.*	Tr.	In.
	17	30		I.*	Sh.	Eg.
	18	0		I.	Tr.	Eg.
27	6	48		III.	Sh.	In.
	9	2		III.*	Tr.	In.
	9	51		III.*	Sh.	Eg.
	10	31		II.*	Sh.	In.
	11	35		II.*	Tr.	In.
	11	42		III.*	Tr.	Eg.
	12	31	55.9	I.*	Ec.	Dis.
	13	20		II.*	Sh.	Eg.
	14	19		II.*	Tr.	Eg.
	15	15		I.*	Oc.	Re.
28	9	41		I.*	Sh.	In.
	10	12		I.*	Tr.	In.
	11	58		I.*	Sh.	Eg.
	12	27		I.*	Tr.	Eg.

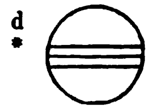
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

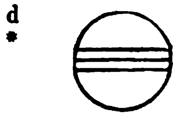
FEBRUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

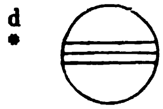
I.



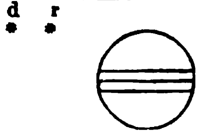
III.



II.



IV.



Configurations at 14ʰ 0ᵐ for an Inverting Telescope.

Day.	West.		East.
1	4· ·3	○	1· ·2
2	·4 ·1	○	2· 3
3	·4 ·2	○	1· ·3
4	·4	○	·2 3· ·1 ●
5	·4 1·	○	3· 2·
6	3· 2·	○	·4 ·1
7	3· ·2 1·	○	·4
8	·3	○	1· ·2 ·4
9	·1	○	2· ·4 ·3 ●
10	2·	○	1· ·3 4·
11	·1	○	3· 4· ·2 ●
12	○ 1·	○	3· 2· 4·
13	3· 2·	○	·1 4·
14	3· ·2 1· 4·	○	
15	·3 4·	○	·1 ·2
16	4· ·1 ·3	○	2·
17	4· 2·	○	1· ·3
18	4· ·1 ·	○	2 3·
19	·4 1	○	· 3· 2·
20	·4 3· 2·	○	·1
21	3· ·4 ·2 1·	○	
22	·3 ·4	○	·1 ·2
23	1· ·3	○	2· ·4
24	2·	○	1· ·3 ·4
25	·1 ·2	○	·3 ·4
26		○	1· ·2 3· ·4
27	○ 2· 3·	○	4· ·1 ●
28	3· ·2 1·	○	4·

WASHINGTON MEAN TIME.

MARCH.

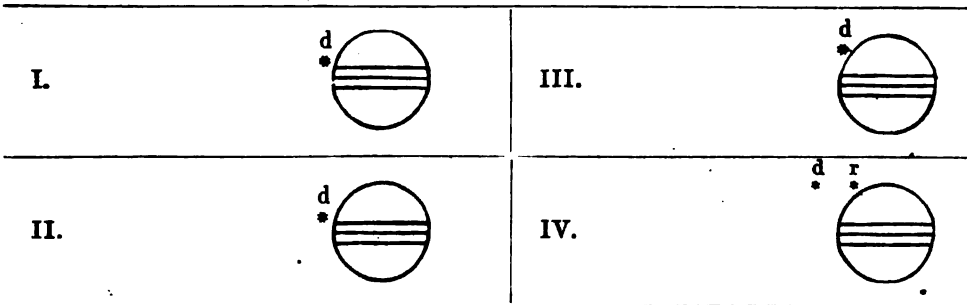
d	h	m	s				d	h	m	s				d	h	m	s			
1	5	5	44.1	II.	Ec.	Dis.	11	5	36	49.1	IV.	Ec.	Dis.	21	15	24		I. *	Tr.	In.
	7	0	16.9	I.	Ec.	Dis.		7	19	52.9	IV.	Ec.	Re.		15	24		I. *	Sh.	In.
	8	47		II. *	Oc.	Re.		20	59	48.3	II.	Ec.	Dis.		17	39		I.	Tr.	Eg.
	9	41		I. *	Oc.	Re.		21	50	28.0	I.	Ec.	Dis.		17	40		I.	Sh.	Eg.
2	4	10		I.	Sh.	In.	12	0	12		II.	Oc.	Re.	22	12	37		I. *	Oc.	Dis.
	4	38		I.	Tr.	In.		0	17		I.	Oc.	Re.		12	50		II. *	Oc.	Dis.
	6	27		I.	Sh.	Eg.		19	2		I.	Sh.	In.		14	52	1.7	I. *	Ec.	Re.
	6	53		I.	Tr.	Eg.		19	14		I.	Tr.	In.		15	40	3.7	II. *	Ec.	Re.
	18	33		IV.	Sh.	In.		21	18		I.	Sh.	Eg.	23	9	50		I. *	Tr.	In.
	20	51		IV.	Sh.	Eg.		21	29		I.	Tr.	Eg.		9	53		I. *	Sh.	In.
	21	2	26.6	III.	Ec.	Dis.	13	14	46		III. *	Sh.	In.		12	5		I. *	Tr.	Eg.
	23	47		II.	Sh.	In.		15	38		III. *	Tr.	In.		12	9		I. *	Sh.	Eg.
3	0	42		II.	Tr.	In.		15	38		II. *	Sh.	In.	24	7	3		I. *	Oc.	Dis.
	1	28	37.5	I.	Ec.	Dis.		16	1		II. *	Tr.	In.		7	20		II. *	Tr.	In.
	1	32		III.	Oc.	Re.		16	18	52.3	I. *	Ec.	Dis.		7	29		II. *	Sh.	In.
	2	37		II.	Sh.	Eg.		17	47		III.	Sh.	Eg.		8	39		III. *	Oc.	Dis.
	3	26		II.	Tr.	Eg.		18	20		III.	Tr.	Eg.		9	20	26.4	I. *	Ec.	Re.
	4	7		I.	Oc.	Re.		18	27		II.	Sh.	Eg.		10	5		II. *	Tr.	Eg.
	22	39		I.	Sh.	In.		18	42		I.	Oc.	Re.		10	17		II. *	Sh.	Eg.
	23	4		I.	Tr.	In.		18	46		II.	Tr.	Eg.		11	45	3.4	III. *	Ec.	Re.
4	0	55		I.	Sh.	Eg.	14	13	30		I. *	Sh.	In.	25	4	16		I.	Tr.	In.
	1	19		I.	Tr.	Eg.		13	40		I. *	Tr.	In.		4	22		I.	Sh.	In.
	18	23	20.8	II.	Ec.	Dis.		15	46		I. *	Sh.	Eg.		6	31		I.	Tr.	Eg.
	19	56	57.8	I.	Ec.	Dis.		15	55		I. *	Tr.	Eg.		6	38		I.	Sh.	Eg.
	21	55		II.	Oc.	Re.	15	10	18	39.3	II. *	Ec.	Dis.	26	1	28		I.	Oc.	Dis.
	22	33		I.	Oc.	Re.		10	47	17.0	I. *	Ec.	Dis.		1	58		II.	Oc.	Dis.
5	17	7		I. *	Sh.	In.		13	8		I. *	Oc.	Re.		3	48	51.5	I.	Ec.	Re.
	17	30		I. *	Tr.	In.		13	20		II. *	Oc.	Re.		4	57	46.8	II.	Ec.	Re.
	19	24		I.	Sh.	Eg.	16	7	59		I. *	Sh.	In.		22	42		I.	Tr.	In.
	19	45		I.	Tr.	Eg.		8	6		I. *	Tr.	In.		22	50		I.	Sh.	In.
6	10	47		III. *	Sh.	In.		10	15		I. *	Sh.	Eg.	27	0	57		I.	Tr.	Eg.
	12	21		III. *	Tr.	In.		10	21		I. *	Tr.	Eg.		1	6		I.	Sh.	Eg.
	13	4		II. *	Sh.	In.	17	4	55		II.	Sh.	In.		19	54		I.	Oc.	Dis.
	13	48		II. *	Tr.	In.		4	58	18.4	III.	Ec.	Dis.		20	26		II.	Tr.	In.
	13	49		III. *	Sh.	Eg.		5	7		II.	Tr.	In.		20	45		II.	Sh.	In.
	14	25	20.8	I. *	Ec.	Dis.		5	15	40.9	I.	Ec.	Dis.		22	9		III.	Tr.	In.
	15	2		III. *	Tr.	Eg.		7	34		I. *	Oc.	Re.		22	17	18.1	I.	Ec.	Re.
	15	53		II. *	Sh.	Eg.		7	44		II. *	Sh.	Eg.		22	42		III.	Sh.	In.
	16	33		II. *	Tr.	Eg.		7	53		II. *	Tr.	Eg.		23	12		II.	Tr.	Eg.
	16	59		I. *	Oc.	Re.		8	7		III. *	Oc.	Re.		23	34		II.	Sh.	Eg.
7	11	36		I. *	Sh.	In.	18	2	27		I.	Sh.	In.		23	42	31.7	IV.	Ec.	Dis.
	11	56		I. *	Tr.	In.		2	32		I.	Tr.	In.	28	0	54		III.	Tr.	Eg.
	13	52		I. *	Sh.	Eg.		4	43		I.	Sh.	Eg.		1	7	3.1	IV.	Ec.	Re.
	14	11		I. *	Tr.	Eg.		4	47		I.	Tr.	Eg.		1	42		III.	Sh.	Eg.
8	7	42	6.8	II. *	Ec.	Dis.		23	36	25.2	II.	Ec.	Dis.		17	8		I.	Tr.	In.
	8	53	43.3	I. *	Ec.	Dis.		23	44	5.2	I.	Ec.	Dis.		17	19		I.	Sh.	In.
	11	4		II. *	Oc.	Re.	19	2	0		I.	Oc.	Re.		19	23		I.	Tr.	Eg.
	11	25		I. *	Oc.	Re.		2	27		II.	Oc.	Re.		19	35		I.	Sh.	Eg.
9	6	5		I.	Sh.	In.		12	36		IV. *	Sh.	In.	29	14	20		I. *	Oc.	Dis.
	6	22		I.	Tr.	In.		14	39		IV. *	Sh.	Eg.		15	6		II. *	Oc.	Dis.
	8	21		I. *	Sh.	Eg.		20	56		I.	Sh.	In.		16	45	45.8	I. *	Ec.	Re.
	8	37		I. *	Tr.	Eg.		20	58		I.	Tr.	In.		18	16	38.5	II.	Ec.	Re.
10	1	0	14.9	III.	Ec.	Dis.		23	12		I.	Sh.	Eg.	30	11	34		I. *	Tr.	In.
	2	21		II.	Sh.	In.		23	13		I.	Tr.	Eg.		11	48		I. *	Sh.	In.
	2	55		II.	Tr.	In.	20	18	11		I.	Oc.	Dis.		13	49		I. *	Tr.	Eg.
	3	22	5.4	I.	Ec.	Dis.		18	12		II.	Sh.	In.		14	4		I. *	Sh.	Eg.
	4	50		III.	Oc.	Re.		18	14		II.	Tr.	In.	31	8	46		I. *	Oc.	Dis.
	5	10		II.	Sh.	Eg.		18	44		III.	Sh.	In.		9	32		II. *	Tr.	In.
	5	40		II.	Tr.	Eg.		18	53		III.	Tr.	In.		10	2		II. *	Sh.	In.
	5	51		I.	Oc.	Re.		20	26		I.	Oc.	Re.		11	14	12.2	I. *	Ec.	Re.
11	0	33		I.	Sh.	In.		20	59		II.	Tr.	Eg.		11	55		III. *	Oc.	Dis.
	0	48		I.	Tr.	In.		21	0		II.	Sh.	Eg.		12	18		II. *	Tr.	Eg.
	2	49		I.	Sh.	Eg.		21	37		III.	Tr.	Eg.		12	50		II. *	Sh.	Eg.
	3	3		I.	Tr.	Eg.		21	44		III.	Sh.	Eg.		15	42	33.5	III. *	Ec.	Re.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

MARCH.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 13ʰ 0ᵐ for an Inverting Telescope.

Day.	West.		East.
1	·3	○	2 ·1 4·
2	3 1·	○	4· 2·
3	2· 4·	○	·1 ·3
4	4· ·1 2	○	·3
5	4·	○	1· ·2 3·
6	○ 3· 4· ·12	○	·
7	○ 1· ·4 3· ·2	○	
8	·4 ·3	○	2 ·1
9	·4 ·3 1·	○	2·
10	·4 2·	○	3 ·1
11	2 ·1	○	·4 ·3
12		○	1· ·2 4 3·
13	·1	○	3· 2· ·4
14	3· 2· 1	○	· ·4
15	·3	○	4· ·1● ·2●
16	·3 1·	○	2· 4·
17	2·	○	·3 ·1 4·
18	2 1·	○	4· ·3
19	4	○	· 1· ·2 3·
20	4· ·1	○	3· 2·
21	4· 2· 3·	○	1·
22	4· 3·	○	·1● ·2●
23	4· ·3 1·	○	2·
24	·4 2·	○	·3 ·1
25	·4 ·2 1·	○	·3
26	·4	○	2 ·1 3·
27	·1 ·4	○	2· 3·
28	2· 3·	○	1· ·4
29	3· 2 ·1	○	·4
30	○ 1· ·3	○	·2 ·4
31	2·	○	·1 ·4 ·3●

WASHINGTON MEAN TIME.

APRIL.

d	h	m	s				d	h	m	s				d	h	m	s			
1	6	0		I.	Tr.	In.	11	7	33		III.*	Tr.	Eg.	21	19	20		IV.	Tr.	Eg.
	6	16		I.	Sh.	In.		9	37		III.*	Sh.	Eg.		20	32		II.	Sh.	Eg.
	8	15		I.*	Tr.	Eg.		20	38		I.	Tr.	In.		21	53		III.	Oc.	Dis.
	8	32		I.*	Sh.	Eg.		21	8		I.	Sh.	In.	22	0	46		III.	Oc.	Re.
2	3	12		I.	Oc.	Dis.		22	53		I.	Tr.	Eg.		0	47		IV.	Sh.	In.
	4	14		II.	Oc.	Dis.		23	24		I.	Sh.	Eg.		0	51	53.9	III.	Ec.	Dis.
	5	42	39.4	I.	Ec.	Re.	12	17	49		I.	Oc.	Dis.		2	17		IV.	Sh.	Eg.
	7	34	24.5	II.*	Ec.	Re.		19	40		II.	Oc.	Dis.		3	35	33.5	III.	Ec.	Re.
3	0	26		I.	Tr.	In.		20	33	37.9	I.	Ec.	Re.		11	16		I.*	Tr.	In.
	0	45		I.	Sh.	In.		23	30	3.0	II.	Ec.	Re.		12	0		I.*	Sh.	In.
	2	41		I.	Tr.	Eg.	13	15	4		I.*	Tr.	In.		13	32		I.*	Tr.	Eg.
	3	1		I.	Sh.	Eg.		15	37		I.*	Sh.	In.		14	16		I.*	Sh.	Eg.
	21	38		I.	Oc.	Dis.		17	20		I.	Tr.	Eg.	23	8	27		I.*	Oc.	Dis.
	22	39		II.	Tr.	In.		17	51	45.2	IV.	Ec.	Dis.		11	8		II.*	Oc.	Dis.
	23	19		II.	Sh.	In.		17	52		I.	Sh.	Eg.		11	24	50.2	I.*	Ec.	Re.
4	0	11	8.1	I.	Ec.	Re.		18	51	58.6	IV.	Ec.	Re.		15	24	43.4	II.	Ec.	Re.
	1	25		III.	Tr.	In.	14	12	15		I.*	Oc.	Dis.	24	5	43		I.	Tr.	In.
	1	25		II.	Tr.	Eg.		14	1		II.*	Tr.	In.		6	29		I.	Sh.	In.
	2	7		II.	Sh.	Eg.		15	2	8.2	I.*	Ec.	Re.		7	59		I.*	Tr.	Eg.
	2	41		III.	Sh.	In.		15	10		II.*	Sh.	In.		8	45		I.*	Sh.	Eg.
	4	13		III.	Tr.	Eg.		16	48		II.	Tr.	Eg.	25	2	54		I.	Oc.	Dis.
	5	39		III.	Sh.	Eg.		17	58		II.	Sh.	Eg.		5	28		II.	Tr.	In.
	18	53		I.	Tr.	In.		18	31		III.	Oc.	Dis.		5	53	23.5	I.	Ec.	Re.
	19	14		I.	Sh.	In.		23	38	4.5	III.	Ec.	Re.		7	1		II.	Sh.	In.
	21	8		I.	Tr.	Eg.	15	9	31		I.*	Tr.	In.		8	14		II.*	Tr.	Eg.
	21	29		I.	Sh.	Eg.		10	6		I.*	Sh.	In.		9	49		II.*	Sh.	Eg.
5	6	41		IV.	Sh.	In.		11	46		I.*	Tr.	Eg.		11	29		III.*	Tr.	In.
	8	29		IV.*	Sh.	Eg.		12	21		I.*	Sh.	Eg.		14	24		III.*	Tr.	Eg.
	16	4		I.*	Oc.	Dis.	16	6	41		I.	Oc.	Dis.		14	39		III.*	Sh.	In.
	17	22		II.	Oc.	Dis.		8	48		II.*	Oc.	Dis.		17	34		III.	Sh.	Eg.
	18	39	37.9	I.	Ec.	Re.		9	30	39.3	I.*	Ec.	Re.	26	0	10		I.	Tr.	In.
	20	53	18.7	II.	Ec.	Re.		12	47	54.4	II.*	Ec.	Re.		0	58		I.	Sh.	In.
6	13	19		I.*	Tr.	In.	17	3	57		I.	Tr.	In.		2	26		I.	Tr.	Eg.
	13	42		I.*	Sh.	In.		4	34		I.	Sh.	In.		3	14		I.	Sh.	Eg.
	15	34		I.*	Tr.	Eg.		6	13		I.	Tr.	Eg.		21	20		I.	Oc.	Dis.
	15	58		I.*	Sh.	Eg.		6	50		I.	Sh.	Eg.	27	0	19		II.	Oc.	Dis.
7	10	30		I.*	Oc.	Dis.	18	1	8		I.	Oc.	Dis.		0	21	59.6	I.	Ec.	Re.
	11	46		II.*	Tr.	In.		3	9		II.	Tr.	In.		4	43	38.6	II.	Ec.	Re.
	12	36		II.*	Sh.	In.		3	59	11.0	I.	Ec.	Re.		18	37		I.	Tr.	In.
	13	8	6.2	I.*	Ec.	Re.		4	27		II.	Sh.	In.		19	26		I.	Sh.	In.
	14	32		II.*	Tr.	Eg.		5	56		II.	Tr.	Eg.		20	53		I.	Tr.	Eg.
	15	12		III.*	Oc.	Dis.		7	15		II.*	Sh.	Eg.		21	42		I.	Sh.	Eg.
	15	24		II.*	Sh.	Eg.		8	5		III.*	Tr.	In.	28	15	47		I.	Oc.	Dis.
	19	40	33.7	III.	Ec.	Re.		10	39		III.*	Sh.	In.		18	37		II.	Tr.	In.
8	7	45		I.*	Tr.	In.		10	57		III.*	Tr.	Eg.		18	50	32.7	I.	Ec.	Re.
	8	11		I.*	Sh.	In.		13	35		III.*	Sh.	Eg.		20	18		II.	Sh.	In.
	10	0		I.*	Tr.	Eg.		22	23		I.	Tr.	In.		21	23		II.	Tr.	Eg.
	10	27		I.*	Sh.	Eg.		23	3		I.	Sh.	In.		23	6		II.	Sh.	Eg.
9	4	56		I.	Oc.	Dis.	19	0	39		I.	Tr.	Eg.	29	1	18		III.	Oc.	Dis.
	6	30		II.	Oc.	Dis.		1	19		I.	Sh.	Eg.		4	14		III.	Oc.	Re.
	7	36	35.6	I.*	Ec.	Re.		19	34		I.	Oc.	Dis.		4	50	35.6	III.	Ec.	Dis.
	10	11	7.8	II.*	Ec.	Re.		21	58		II.	Oc.	Dis.		7	33	9.0	III.*	Ec.	Re.
10	2	12		I.	Tr.	In.		22	27	45.3	I.	Ec.	Re.		13	4		I.*	Tr.	In.
	2	40		I.	Sh.	In.	20	2	6	50.2	II.	Ec.	Re.		13	55		I.*	Sh.	In.
	4	27		I.	Tr.	Eg.		16	50		I.	Tr.	In.		15	20		I.	Tr.	Eg.
	4	55		I.	Sh.	Eg.		17	32		I.	Sh.	In.		16	11		I.	Sh.	Eg.
	23	23		I.	Oc.	Dis.		19	6		I.	Tr.	Eg.	30	3	26		IV.	Oc.	Dis.
11	0	53		II.	Tr.	In.		19	48		I.	Sh.	Eg.		4	51		IV.	Oc.	Re.
	1	53		II.	Sh.	In.	21	14	1		I.*	Oc.	Dis.		10	14		I.*	Oc.	Dis.
	2	5	5.8	I.	Ec.	Re.		16	18		II.	Tr.	In.		12	14	15.8	IV.*	Ec.	Dis.
	3	40		II.	Tr.	Eg.		16	56	17.0	I.	Ec.	Re.		12	26	11.0	IV.*	Ec.	Re.
	4	41		II.	Sh.	Eg.		17	44		II.	Sh.	In.		13	19	7.9	I.*	Ec.	Re.
	4	43		III.	Tr.	In.		18	21		IV.	Tr.	In.		13	29		II.*	Oc.	Dis.
	6	40		III.	Sh.	In.		19	5		II.	Tr.	Eg.		18	1	33.2	II.	Ec.	Re.

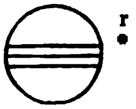
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse. Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

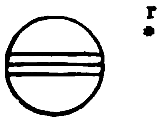
APRIL.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

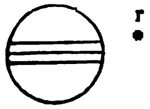
I.



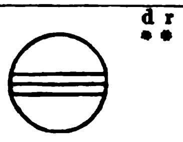
III.



II.



IV.



Configurations at 12ʰ 0ᵐ for an Inverting Telescope.

Day.	West.		East.
1	·2 1·	○	·3 4·
2		○	·2 ·1 3· 4·
3	1·	○	2· 3· 4·
4	2· 3·	○	1· 4·
5	3· ·2 ·1 4·	○	
6	·3 4·	○	1· ·2
7	○ 2· 4· ·3	○	·1 ●
8	4· ·2 1·	○	·3
9	·4	○	·2 ·1 3·
10	·4 1·	○	2· 3·
11	·4 2· 3·	○	1·
12	3· ·4 ·2 ·1	○	
13	·3	·4 ○	1· ·2
14	·3 ·	○	12· ·4
15	2· 1·	○	·3 ·4
16		○	·2 ·1 ·3 ·4
17	1·	○	2· 3· ·4
18	2· 3·	○	·1 4·
19	3· ·2 ·1	○	4·
20	·3	○	1· ·2 4·
21	·3 ·1	○	2· 4·
22	○ 1· 2· 4·	○	·3
23	4·	○	·1 ·3 ·2 ●
24	4· 1·	○	2· 3·
25	○ 3· 4· 2·	○	·1
26	·4 3· ·2 ·1	○	
27	·4 ·3	○	1· ·2
28	·4 ·3 ·1	○	2.
29	2· ·4	○	1· ·3
30	·2	○	·4 ·3 ·1 ●

WASHINGTON MEAN TIME.

MAY.

d	h	m	s			
1	7	31		I.	Tr.	In.
	8	24		I.	* Sh.	In.
	9	47		I.	* Tr.	Eg.
	10	40		I.	* Sh.	Eg.
2	4	41		I.	Oc.	Dis.
	7	47		II.	* Tr.	In.
	7	47	42.5	I.	* Ec.	Re.
	9	36		II.	* Sh.	In.
	10	33		II.	* Tr.	Eg.
	12	23		II.	* Sh.	Eg.
	14	57		III.	Tr.	In.
	17	54		III.	Tr.	Eg.
	18	39		III.	Sh.	In.
	21	32		III.	Sh.	Eg.
3	1	58		I.	Tr.	In.
	2	52		I.	Sh.	In.
	4	14		I.	Tr.	Eg.
	5	8		I.	Sh.	Eg.
	23	8		I.	Oc.	Dis.
4	2	16	20.4	I.	Ec.	Re.
	2	41		II.	Oc.	Dis.
	7	20	26.4	II.	Ec.	Re.
	20	25		I.	Tr.	In.
	21	21		I.	Sh.	In.
	22	41		I.	Tr.	Eg.
	23	37		I.	Sh.	Eg.
5	17	35		I.	Oc.	Dis.
	20	44	55.0	I.	Ec.	Re.
	20	57		II.	Tr.	In.
	22	53		II.	Sh.	In.
	23	44		II.	Tr.	Eg.
6	1	41		II.	Sh.	Eg.
	4	48		III.	Oc.	Dis.
	7	46		III.	* Oc.	Re.
	8	49	30.9	III.	* Ec.	Dis.
	11	30	58.3	III.	* Ec.	Re.
	14	53		I.	Tr.	In.
	15	50		I.	Sh.	In.
	17	8		I.	Tr.	Eg.
	18	6		I.	Sh.	Eg.
7	12	1		I.	* Oc.	Dis.
	15	13	31.9	I.	Ec.	Re.
	15	53		II.	Oc.	Dis.
	20	38	22.4	II.	Ec.	Re.
8	9	20		I.	* Tr.	In.
	9	20		IV.	* Tr.	In.
	10	19		I.	* Sh.	In.
	11	5		IV.	* Tr.	Eg.
	11	35		I.	* Tr.	Eg.
	12	34		I.	* Sh.	Eg.
	18	55		IV.	Sh.	In.
	20	4		IV.	Sh.	Eg.
9	6	29		I.	Oc.	Dis.
	9	42	7.7	I.	* Ec.	Re.
	10	8		II.	* Tr.	In.
	12	11		II.	* Sh.	In.
	12	55		II.	* Tr.	Eg.
	14	58		II.	Sh.	Eg.
	18	30		III.	Tr.	In.
	21	29		III.	Tr.	Eg.
	22	38		III.	Sh.	In.
10	1	30		III.	Sh.	Eg.
	3	47		I.	Tr.	In.
	4	48		I.	Sh.	In.
	6	2		I.	Tr.	Eg.
	7	3		I.	Sh.	Eg.
11	0	56		I.	Oc.	Dis.
	4	10	47.3	I.	Ec.	Re.

d	h	m	s			
11	5	6		II.	Oc.	Dis.
	9	57	13.6	II.	* Ec.	Re.
	22	14		I.	Tr.	In.
	28	17		I.	Sh.	In.
12	0	30		I.	Tr.	Eg.
	1	32		I.	Sh.	Eg.
	19	23		I.	Oc.	Dis.
	22	39	23.2	I.	Ec.	Re.
	23	20		II.	Tr.	In.
13	1	28		II.	Sh.	In.
	2	7		II.	Tr.	Eg.
	4	16		II.	Sh.	Eg.
	8	23		III.	* Oc.	Dis.
	11	23		III.	* Oc.	Re.
	12	49	9.2	III.	* Ec.	Dis.
	15	29	30.2	III.	Ec.	Re.
	16	41		I.	Tr.	In.
	17	45		I.	Sh.	In.
	18	57		I.	Tr.	Eg.
	20	0		I.	Sh.	Eg.
14	13	50		I.	* Oc.	Dis.
	17	8	1.3	I.	Ec.	Re.
	18	19		II.	Oc.	Dis.
	23	15	9.7	II.	Ec.	Re.
15	11	9		I.	* Tr.	In.
	12	14		I.	* Sh.	In.
	13	25		I.	* Tr.	Eg.
	14	29		I.	Sh.	Eg.
16	8	18		I.	* Oc.	Dis.
	11	36	38.5	I.	* Ec.	Re.
	12	32		II.	* Tr.	In.
	14	46		II.	Sh.	In.
	15	20		II.	Tr.	Eg.
	17	33		II.	Sh.	Eg.
	18	56		IV.	Oc.	Dis.
	20	56		IV.	Oc.	Re.
	22	7		III.	Tr.	In.
17	1	7		III.	Tr.	Eg.
	2	37		III.	Sh.	In.
	5	28		III.	Sh.	Eg.
	5	37		I.	Tr.	In.
	6	43		I.	Sh.	In.
	7	53		I.	* Tr.	Eg.
	8	58		I.	* Sh.	Eg.
18	2	45		I.	Oc.	Dis.
	6	5	19.4	I.	Ec.	Re.
	7	33		II.	Oc.	Dis.
	12	33	57.6	II.	* Ec.	Re.
19	0	4		I.	Tr.	In.
	1	11		I.	Sh.	In.
	2	20		I.	Tr.	Eg.
	3	27		I.	Sh.	Eg.
	21	13		I.	Oc.	Dis.
20	0	33	56.8	I.	Ec.	Re.
	1	45		II.	Tr.	In.
	4	3		II.	Sh.	In.
	4	33		II.	Tr.	Eg.
	6	50		II.	Sh.	Eg.
	12	2		III.	* Oc.	Dis.
	15	3		III.	Oc.	Re.
	16	48	28.7	III.	Ec.	Dis.
	18	32		I.	Tr.	In.
	19	27	43.1	III.	Ec.	Re.
	19	40		I.	Sh.	In.
	20	48		I.	Tr.	Eg.
	21	56		I.	Sh.	Eg.
21	15	40		I.	Oc.	Dis.
	19	2	36.4	I.	Ec.	Re.

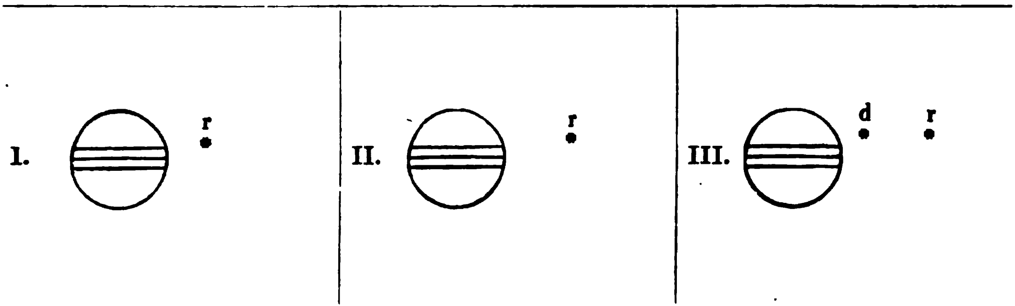
d	h	m	s			
21	20	47		II.	Oc.	Dis.
22	1	51	53.5	II.	Ec.	Re.
	13	0		I.	* Tr.	In.
	14	9		I.	Sh.	In.
	15	16		I.	Tr.	Eg.
	16	25		I.	Sh.	Eg.
23	10	8		I.	* Oc.	Dis.
	13	31	14.4	I.	Ec.	Re.
	14	59		II.	Tr.	In.
	17	21		II.	Sh.	In.
	17	47		II.	Tr.	Eg.
	20	8		II.	Sh.	Eg.
24	1	48		III.	Tr.	In.
	4	50		III.	Tr.	Eg.
	6	36		III.	Sh.	In.
	7	28		I.	Tr.	In.
	8	37		I.	* Sh.	In.
	9	27		III.	* Sh.	Eg.
	9	44		I.	* Tr.	Eg.
	10	53		I.	* Sh.	Eg.
25	1	23		IV.	Tr.	In.
	3	34		IV.	Tr.	Eg.
	4	36		I.	Oc.	Dis.
	7	59	56.5	I.	* Ec.	Re.
	10	2		II.	* Oc.	Dis.
	13	16		IV.	Sh.	In.
	13	41		IV.	Sh.	Eg.
	15	10	37.2	II.	Ec.	Re.
26	1	56		I.	Tr.	In.
	3	6		I.	Sh.	In.
	4	12		I.	Tr.	Eg.
	5	22		I.	Sh.	Eg.
	23	4		I.	Oc.	Dis.
27	2	28	34.9	I.	Ec.	Re.
	4	13		II.	Tr.	In.
	6	38		II.	Sh.	In.
	7	2		II.	Tr.	Eg.
	9	25		II.	* Sh.	Eg.
	15	46		III.	Oc.	Dis.
	18	49		III.	Oc.	Re.
	20	24		I.	Tr.	In.
	20	48	12.8	III.	Ec.	Dis.
	21	35		I.	Sh.	In.
	22	40		I.	Tr.	Eg.
	23	26	20.0	III.	Ec.	Re.
	23	51		I.	Sh.	Eg.
28	17	32		I.	Oc.	Dis.
	20	57	15.7	I.	Ec.	Re.
	23	17		II.	Oc.	Dis.
29	4	28	32.6	II.	Ec.	Re.
	14	52		I.	Tr.	In.
	16	4		I.	Sh.	In.
	17	8		I.	Tr.	Eg.
	18	19		I.	Sh.	Eg.
30	12	0		I.	* Oc.	Dis.
	15	25	54.4	I.	Ec.	Re.
	17	28		II.	Tr.	In.
	19	56		II.	Sh.	In.
	20	17		II.	Tr.	Eg.
	22	43		II.	Sh.	Eg.
31	5	33		III.	Tr.	In.
	8	37		III.	* Tr.	Eg.
	9	20		I.	* Tr.	In.
	10	33		I.	* Sh.	In.
	10	35		III.	* Sh.	In.
	11	36		I.	* Tr.	Eg.
	12	48		I.	* Sh.	Eg.
	13	25		III.	Sh.	Eg.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

MAY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 11h 0m for an Inverting Telescope.

Day.	West.	East.
1	1·	·2 4 3·
2	2·	3· ·1 ·4
3	3· ·2 1·	·4
4	3·	2 1· 4·
5	·3 ·1	2· 4·
6	2·	3 1· 4·
7	·2 ·1	4· ·3
8	○ 1· ○ 4·	·2 3·
9	○ 2· 4·	·1 3 ·
10	4· 2 3· 1·	
11	4· 3·	·2 ·1
12	4· ·3 ·1	2·
13	·4 2·	1· ·3 ●
14	·4 ·2 ·1	·3
15	·4 1	· ·2 3·
16	·4	·1 2· 3·
17	2· 3· 1·	·4
18	3·	·2 ·1 ·4
19	·3 1·	2· ·4
20	2· ·	3 1· ·4
21	·2 ·1	·3 4·
22		1· ·2 3· 4·
23		2· 3· 4· ·1 ●
24	2· 3· 1·	4·
25	3· 4·	·1 ·2 ●
26	3 4· 1·	2·
27	4· 3 2·	1·
28	4· ·2 ·1	·3
29	·4	1· ·2 ·3
30	·4 ·1	2· 3·
31	○ 1· ·4 2· 3·	

WASHINGTON MEAN TIME.

JUNE.

d	h	m	s			
1	6	28		I.	Oc.	Dis.
	9	54	37.7	I.*	Ec.	Re.
	12	33		II.*	Oc.	Dis.
	17	47	11.0	II.	Ec.	Re.
2	3	48		I.	Tr.	In.
	5	2		I.	Sh.	In.
	6	4		I.	Tr.	Eg.
	7	17		I.	Sh.	Eg.
	11	29		IV.*	Oc.	Dis.
	13	48		IV.	Oc.	Re.
3	0	56		I.	Oc.	Dis.
	4	23	17.0	I.	Ec.	Re.
	6	43		II.	Tr.	In.
	9	14		II.*	Sh.	In.
	9	32		II.*	Tr.	Eg.
	12	0		II.*	Sh.	Eg.
	19	34		III.	Oc.	Dis.
	22	16		I.	Tr.	In.
	22	38		III.	Oc.	Re.
	23	30		I.	Sh.	In.
4	0	32		I.	Tr.	Eg.
	0	47	24.6	III.	Ec.	Dis.
	1	45		I.	Sh.	Eg.
	3	24	23.8	III.	Ec.	Re.
	19	24		I.	Oc.	Dis.
	22	51	58.7	I.	Ec.	Re.
5	1	49		II.	Oc.	Dis.
	7	5	4.9	II.	Ec.	Re.
	16	44		I.	Tr.	In.
	17	59		I.	Sh.	In.
	19	0		I.	Tr.	Eg.
	20	14		I.	Sh.	Eg.
6	13	52		I.	Oc.	Dis.
	17	20	38.0	I.	Ec.	Re.
	19	59		II.	Tr.	In.
	22	32		II.	Sh.	In.
	22	48		II.	Tr.	Eg.
7	1	18		II.	Sh.	Eg.
	9	25		III.*	Tr.	In.
	11	13		I.*	Tr.	In.
	12	28		I.	Sh.	In.
	12	28		III.	Tr.	Eg.
	13	29		I.	Tr.	Eg.
	14	35		III.	Sh.	In.
	14	43		I.	Sh.	Eg.
	17	24		III.	Sh.	Eg.
8	8	21		I.*	Oc.	Dis.
	11	49	22.2	I.*	Ec.	Re.
	15	6		II.	Oc.	Dis.
	20	23	38.8	II.	Ec.	Re.
9	5	41		I.	Tr.	In.
	6	56		I.	Sh.	In.
	7	57		I.	Tr.	Eg.
	9	11		I.*	Sh.	Eg.
10	2	49		I.	Oc.	Dis.
	6	18	2.0	I.	Ec.	Re.
	9	16		II.*	Tr.	In.
	11	50		II.*	Sh.	In.
	12	5		II.	Tr.	Eg.
	14	35		II.	Sh.	Eg.
	18	25		IV.	Tr.	In.
	20	52		IV.	Tr.	Eg.
	23	26		III.	Oc.	Dis.
11	0	9		I.	Tr.	In.
11	1	25		I.	Sh.	In.
	2	25		I.	Tr.	Eg.
	2	31		III.	Oc.	Re.
	3	40		I.	Sh.	Eg.
	4	46	31.1	III.	Ec.	Dis.
	7	22	22.1	III.	Ec.	Re.
	21	17		I.	Oc.	Dis.
12	0	46	44.5	I.	Ec.	Re.
	4	23		II.	Oc.	Dis.
	9	41	29.9	II.*	Ec.	Re.
	18	38		I.	Tr.	In.
	19	54		I.	Sh.	In.
	20	54		I.	Tr.	Eg.
	22	9		I.	Sh.	Eg.
13	15	46		I.	Oc.	Dis.
	19	15	24.2	I.	Ec.	Re.
	22	33		II.	Tr.	In.
14	1	8		II.	Sh.	In.
	1	22		II.	Tr.	Eg.
	3	53		II.	Sh.	Eg.
	13	6		I.	Tr.	In.
	13	20		III.	Tr.	In.
	14	22		I.	Sh.	In.
	15	22		I.	Tr.	Eg.
	16	24		III.	Tr.	Eg.
	16	37		I.	Sh.	Eg.
	18	35		III.	Sh.	In.
	21	22		III.	Sh.	Eg.
15	10	14		I.*	Oc.	Dis.
	13	44	9.0	I.	Ec.	Re.
	17	41		II.	Oc.	Dis.
	22	59	56.6	II.	Ec.	Re.
16	7	35		I.	Tr.	In.
	8	51		I.*	Sh.	In.
	9	51		I.*	Tr.	Eg.
	11	6		I.*	Sh.	Eg.
17	4	43		I.	Oc.	Dis.
	8	12	49.5	I.*	Ec.	Re.
	11	51		II.	Tr.	In.
	14	26		II.	Sh.	In.
	14	40		II.	Tr.	Eg.
	17	11		II.	Sh.	Eg.
18	2	4		I.	Tr.	In.
	3	20		I.	Sh.	In.
	3	23		III.	Oc.	Dis.
	4	20		I.	Tr.	Eg.
	5	35		I.	Sh.	Eg.
	6	28		III.	Oc.	Re.
	8	45	41.8	III.*	Ec.	Dis.
	11	20	24.4	III.*	Ec.	Re.
	23	12		I.	Oc.	Dis.
19	2	41	32.8	I.	Ec.	Re.
	5	1		IV.	Oc.	Dis.
	7	0		II.	Oc.	Dis.
	7	31		IV.	Oc.	Re.
	12	17	46.5	II.	Ec.	Re.
	20	32		I.	Tr.	In.
	21	49		I.	Sh.	In.
	22	49		I.	Tr.	Eg.
20	0	4		I.	Sh.	Eg.
	17	41		I.	Oc.	Dis.
	21	10	12.7	I.	Ec.	Re.
21	1	9		II.	Tr.	In.
	3	44		II.	Sh.	In.
21	3	58		II.	Tr.	Eg.
	6	29		II.	Sh.	Eg.
	15	1		I.	Tr.	In.
	16	18		I.	Sh.	In.
	17	18		I.	Tr.	Eg.
	17	19		III.	Tr.	In.
	18	33		I.	Sh.	Eg.
	20	24		III.	Tr.	Eg.
	22	35		III.	Sh.	In.
22	1	21		III.	Sh.	Eg.
	12	10		I.	Oc.	Dis.
	15	38	58.5	I.	Ec.	Re.
	20	19		II.	Oc.	Dis.
23	1	36	6.6	II.	Ec.	Re.
	9	30		I.*	Tr.	In.
	10	47		I.*	Sh.	In.
	11	47		I.	Tr.	Eg.
	13	2		I.	Sh.	Eg.
24	6	38		I.	Oc.	Dis.
	10	7	39.3	I.*	Ec.	Re.
	14	28		II.	Tr.	In.
	17	1		II.	Sh.	In.
	17	16		II.	Tr.	Eg.
	19	46		II.	Sh.	Eg.
25	3	59		I.	Tr.	In.
	5	15		I.	Sh.	In.
	6	16		I.	Tr.	Eg.
	7	24		III.	Oc.	Dis.
	7	30		I.	Sh.	Eg.
	10	28		III.*	Oc.	Re.
	12	45	1.1	III.	Ec.	Dis.
	15	18	35.5	III.	Ec.	Re.
26	1	7		I.	Oc.	Dis.
	4	36	23.1	I.	Ec.	Re.
	9	38		II.*	Oc.	Dis.
	14	53	53.5	II.	Ec.	Re.
	22	28		I.	Tr.	In.
	23	44		I.	Sh.	In.
27	0	45		I.	Tr.	Eg.
	1	59		I.	Sh.	Eg.
	12	24		IV.	Tr.	In.
	14	55		IV.	Tr.	Eg.
	19	36		I.	Oc.	Dis.
	23	5	3.3	I.	Ec.	Re.
28	3	47		II.	Tr.	In.
	6	19		II.	Sh.	In.
	6	35		II.	Tr.	Eg.
	9	4		II.*	Sh.	Eg.
	16	57		I.	Tr.	In.
	18	13		I.	Sh.	In.
	19	14		I.	Tr.	Eg.
	20	28		I.	Sh.	Eg.
	21	21		III.	Tr.	In.
29	0	26		III.	Tr.	Eg.
	2	34		III.	Sh.	In.
	5	19		III.	Sh.	Eg.
	14	5		I.	Oc.	Dis.
	17	33	49.4	I.	Ec.	Re.
	22	57		II.	Oc.	Dis.
30	4	12	6.4	II.	Ec.	Re.
	11	26		I.	Tr.	In.
	12	41		I.	Sh.	In.
	13	43		I.	Tr.	Eg.
	14	56		I.	Sh.	Eg.

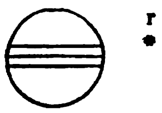
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

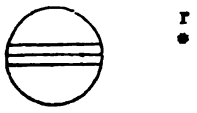
JUNE.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

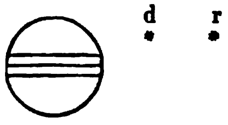
I.



II.



III.



Configurations at 10ʰ 0ᵐ for an Inverting Telescope.

Day.	West.		East.
1	3· ·4 ·2	O	·1
2	·3 1· ·	O	4 ·2
3	O 2· ·3	O	·1 ·4
4	·2 ·1	O	·3 ·4
5		O	2 1· ·3 ·4
6	·1	O	2· 3· ·4
7	O 3· 2· 1	O	· 4·
8	3· ·2	O	4· ·1 ●
9	·3 1·	O	·2 4·
10	O 2· ·3	O	4· ·1
11	·2 1· 4·	O	·3
12	4·	O	·2 1· ·3
13	4· ·1	O	2· 3·
14	4· 2·	O	3· 1·
15	·4 3· ·2 ·	O	1
16	·4 ·3 1·	O	·2
17	·4 ·3	O	2· ·1
18	2· ·4 1·	O	·3
19		O	2 ·4 ·1 ·3
20	·1	O	2· ·4 3·
21	2·	O	1· 3· ·4
22	3· 2 ·1	O	·4
23	O 1· 3·	O	·2 ·4
24	·3	O	·1 2· 4·
25	2· 1·	O	4· ·3 ●
26		O	·1 4· 3 ·2 ●
27	1·	O	4· 2· 3·
28	4· 2·	O	1· 3·
29	4· 2 3· ·1	O	
30	4· 3·	O	1· ·2

WASHINGTON MEAN TIME.

JULY.

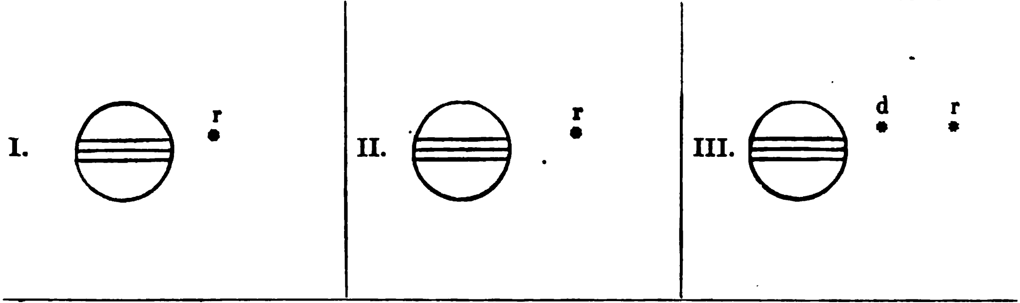
d	h	m	s			
1	8	35		I. *	Oc.	Dis.
	12	2	30.2	I.	Ec.	Re.
	17	6		II.	Tr.	In.
	19	37		II.	Sh.	In.
	19	55		II.	Tr.	Eg.
	22	22		II.	Sh.	Eg.
2	5	55		I.	Tr.	In.
	7	10		I.	Sh.	In.
	8	12		I. *	Tr.	Eg.
	9	25		I. *	Sh.	Eg.
	11	29		III.	Oc.	Dis.
	14	33		III.	Oc.	Re.
	16	44	58.3	III.	Ec.	Dis.
	19	17	23.9	III.	Ec.	Re.
3	3	4		I.	Oc.	Dis.
	6	31	14.3	I.	Ec.	Re.
	12	17		II.	Oc.	Dis.
	17	29	50.1	II.	Ec.	Re.
4	0	25		I.	Tr.	In.
	1	39		I.	Sh.	In.
	2	41		I.	Tr.	Eg.
	3	54		I.	Sh.	Eg.
	21	33		I.	Oc.	Dis.
5	0	59	54.8	I.	Ec.	Re.
	6	26		II.	Tr.	In.
	8	55		II. *	Sh.	In.
	9	15		II. *	Tr.	Eg.
	11	40		II.	Sh.	Eg.
	18	54		I.	Tr.	In.
	20	7		I.	Sh.	In.
	21	10		I.	Tr.	Eg.
	22	22		I.	Sh.	Eg.
	23	26		IV.	Oc.	Dis.
6	1	27		III.	Tr.	In.
	1	57		IV.	Oc.	Re.
	4	32		III.	Tr.	Eg.
	6	33		III.	Sh.	In.
	9	17		III. *	Sh.	Eg.
	16	2		I.	Oc.	Dis.
	19	28	40.8	I.	Ec.	Re.
7	1	37		II.	Oc.	Dis.
	6	47	55.6	II.	Ec.	Re.
	13	23		I.	Tr.	In.
	14	36		I.	Sh.	In.
	15	39		I.	Tr.	Eg.
	16	51		I.	Sh.	Eg.
8	10	31		I.	Oc.	Dis.
	13	57	22.0	I.	Ec.	Re.
	19	46		II.	Tr.	In.
	22	13		II.	Sh.	In.
	22	35		II.	Tr.	Eg.
9	0	58		II.	Sh.	Eg.
	7	53		I.	Tr.	In.
	9	5		I. *	Sh.	In.
	10	9		I. *	Tr.	Eg.
	11	20		I.	Sh.	Eg.
	15	37		III.	Oc.	Dis.
	18	41		III.	Oc.	Re.
	20	44	31.1	III.	Ec.	Dis.
	23	15	47.5	III.	Ec.	Re.
10	5	1		I.	Oc.	Dis.
	8	26	6.2	I. *	Ec.	Re.
	14	58		II.	Oc.	Dis.
	20	5	35.8	II.	Ec.	Re.
11	2	22		I.	Tr.	In.
	3	33		I.	Sh.	In.
	4	38		I.	Tr.	Eg.
11	5	48		I.	Sh.	Eg.
	23	30		I.	Oc.	Dis.
12	2	54	46.4	I.	Ec.	Re.
	9	7		II. *	Tr.	In.
	11	31		II.	Sh.	In.
	11	56		II.	Tr.	Eg.
	14	16		II.	Sh.	Eg.
	20	51		I.	Tr.	In.
	22	2		I.	Sh.	In.
	23	7		I.	Tr.	Eg.
13	0	17		I.	Sh.	Eg.
	5	36		III.	Tr.	In.
	8	40		III. *	Tr.	Eg.
	10	32		III.	Sh.	In.
	13	15		III.	Sh.	Eg.
	18	0		I.	Oc.	Dis.
	21	23	32.9	I.	Ec.	Re.
14	4	19		II.	Oc.	Dis.
	7	12		IV.	Tr.	In.
	9	23	33.8	II. *	Ec.	Re.
	9	40		IV. *	Tr.	Eg.
	15	21		I.	Tr.	In.
	16	31		I.	Sh.	In.
	17	37		I.	Tr.	Eg.
	18	46		I.	Sh.	Eg.
15	12	29		I.	Oc.	Dis.
	15	52	13.7	I.	Ec.	Re.
	22	28		II.	Tr.	In.
16	0	49		II.	Sh.	In.
	1	17		II.	Tr.	Eg.
	3	34		II.	Sh.	Eg.
	9	50		I. *	Tr.	In.
	10	59		I.	Sh.	In.
	12	6		I.	Tr.	Eg.
	13	14		I.	Sh.	Eg.
	19	48		III.	Oc.	Dis.
	22	52		III.	Oc.	Re.
17	0	44	23.0	III.	Ec.	Dis.
	3	14	30.0	III.	Ec.	Re.
	6	59		I.	Oc.	Dis.
	10	20	58.2	I.	Ec.	Re.
	17	40		II.	Oc.	Dis.
	22	41	10.2	II.	Ec.	Re.
18	4	20		I.	Tr.	In.
	5	28		I.	Sh.	In.
	6	36		I.	Tr.	Eg.
	7	43		I.	Sh.	Eg.
19	1	28		I.	Oc.	Dis.
	4	49	38.2	I.	Ec.	Re.
	11	50		II.	Tr.	In.
	14	7		II.	Sh.	In.
	14	39		II.	Tr.	Eg.
	16	52		II.	Sh.	Eg.
	22	49		I.	Tr.	In.
	23	57		I.	Sh.	In.
20	1	6		I.	Tr.	Eg.
	2	12		I.	Sh.	Eg.
	9	49		III.	Tr.	In.
	12	52		III.	Tr.	Eg.
	14	32		III.	Sh.	In.
	17	13		III.	Sh.	Eg.
	19	58		I.	Oc.	Dis.
	23	18	24.7	I.	Ec.	Re.
21	7	1		II.	Oc.	Dis.
	11	59	0.7	II.	Ec.	Re.
	17	19		I.	Tr.	In.
	18	26		I.	Sh.	In.
21	19	35		I.	Tr.	Eg.
	20	41		I.	Sh.	Eg.
22	14	27		I.	Oc.	Dis.
	17	47	5.5	I.	Ec.	Re.
	18	34		IV.	Oc.	Dis.
	21	1		IV.	Oc.	Re.
23	1	12		II.	Tr.	In.
	3	25		II.	Sh.	In.
	4	1		II.	Tr.	Eg.
	6	10		II.	Sh.	Eg.
	11	48		I.	Tr.	In.
	12	55		I.	Sh.	In.
	14	5		I.	Tr.	Eg.
	15	10		I.	Sh.	Eg.
24	0	2		III.	Oc.	Dis.
	3	5		III.	Oc.	Re.
	4	43	38.0	III.	Ec.	Dis.
	7	12	35.2	III.	Ec.	Re.
	8	57		I. *	Oc.	Dis.
	12	15	50.0	I.	Ec.	Re.
	20	23		II.	Oc.	Dis.
25	1	16	33.2	II.	Ec.	Re.
	6	18		I.	Tr.	In.
	7	24		I.	Sh.	In.
	8	35		I. *	Tr.	Eg.
	9	39		I.	Sh.	Eg.
26	3	27		I.	Oc.	Dis.
	6	44	29.6	I.	Ec.	Re.
	14	34		II.	Tr.	In.
	16	44		II.	Sh.	In.
	17	23		II.	Tr.	Eg.
	19	28		II.	Sh.	Eg.
27	0	47		I.	Tr.	In.
	1	52		I.	Sh.	In.
	3	4		I.	Tr.	Eg.
	4	7		I.	Sh.	Eg.
	14	4		III.	Tr.	In.
	17	7		III.	Tr.	Eg.
	18	31		III.	Sh.	In.
	21	12		III.	Sh.	Eg.
	21	57		I.	Oc.	Dis.
28	1	13	15.8	I.	Ec.	Re.
	9	45		II.	Oc.	Dis.
	14	34	15.8	II.	Ec.	Re.
	19	17		I.	Tr.	In.
	20	21		I.	Sh.	In.
	21	34		I.	Tr.	Eg.
	22	36		I.	Sh.	Eg.
29	16	26		I.	Oc.	Dis.
	19	41	56.5	I.	Ec.	Re.
30	3	57		II.	Tr.	In.
	6	2		II.	Sh.	In.
	6	45		II.	Tr.	Eg.
	8	46		II. *	Sh.	Eg.
	13	47		I.	Tr.	In.
	14	50		I.	Sh.	In.
	16	4		I.	Tr.	Eg.
	17	4		I.	Sh.	Eg.
31	2	37		IV.	Tr.	In.
	4	18		III.	Oc.	Dis.
	4	58		IV.	Tr.	Eg.
	7	20		III.	Oc.	Re.
	8	42	45.6	III. *	Ec.	Dis.
	10	56		I.	Oc.	Dis.
	11	10	32.6	III.	Ec.	Re.
	14	10	41.1	I.	Ec.	Re.
	23	7		II. *	Oc.	Dis.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

JULY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 9h 0m for an Inverting Telescope.

Day.	West.		East.
1	4· ·3	○	2· ·1 ●
2	·4 2· 3 1·	○	
3	·4 ·2	○	·1 ·3
4	·4 1·	○	·2 3·
5	○ 2· ·4	○	·1 3·
6	·2 ·1 3·	○	·4
7	3·	○	2 1· ·4
8	·3 ·1	○	2· ·4
9	○ 1· 2· ·3	○	·4
10	·2	○	·1 ·3 4·
11	1·	○	·2 ·3 4·
12	2	○·	·1 3· 4·
13	·2 ·1 3·	○	4·
14	○ 4· 3·	○	·2 1·
15	·3 4· ·1	○	2·
16	4· ·3 2· 1	○ ·	
17	4· ·2	○	·3 ·1 ●
18	4· 1·	○	·2 ·3
19	·4	○	2· ·1 3·
20	·4 2· 1· 3	○·	
21	·4 3·	○	1· ·2 ●
22	·3 ·1 ·4	○	2·
23	·3 2·	○	1· ·4
24	·2	○	·3 ·4 ·1 ●
25	1·	○	·2 ·3 ·4
26		○	·1 2· 3· ·4
27	2· 1·	○	3· 4·
28	3· ·2	○	·1 4·
29	3· ·1	○	2· 4·
30	·3 2·	○	1· 4·
31	·2 ·1 4·	○	·3

WASHINGTON MEAN TIME.

AUGUST.

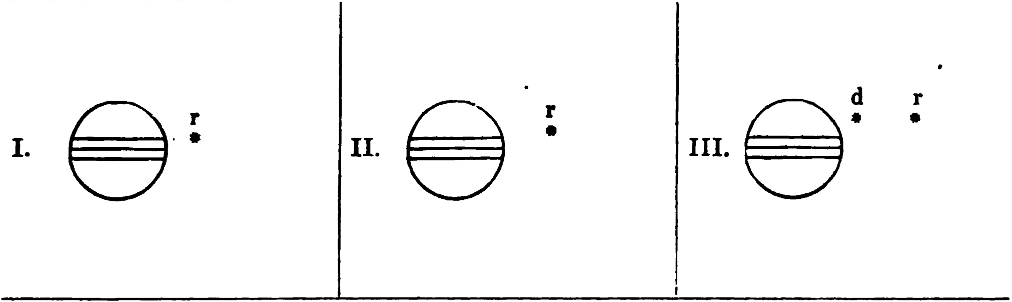
d	h	m	s			
1	3	51	44.2	II.	Ec.	Re.
	8	17		I.*	Tr.	In.
	9	18		I.	Sh.	In.
	10	33		I.	Tr.	Eg.
	11	33		I.	Sh.	Eg.
2	5	26		I.	Oc.	Dis.
	8	39	20.2	I.*	Ec.	Re.
	17	20		II.	Tr.	In.
	19	20		II.	Sh.	In.
	20	8		II.	Tr.	Eg.
	22	4		II.	Sh.	Eg.
3	2	47		I.	Tr.	In.
	3	47		I.	Sh.	In.
	5	3		I.	Tr.	Eg.
	6	1		I.	Sh.	Eg.
	18	22		III.	Tr.	In.
	21	23		III.	Tr.	Eg.
	22	31		III.	Sh.	In.
	23	53		I.	Oc.	Dis.
4	1	10		III.	Sh.	Eg.
	3	8	6.2	I.	Ec.	Re.
	12	30		II.	Oc.	Dis
	17	9	19.3	II.	Ec.	Re.
	21	17		I.	Tr.	In.
	22	16		I.	Sh.	In.
	23	33		I.	Tr.	Eg.
5	0	30		I.	Sh.	Eg.
	18	26		I.	Oc.	Dis.
	21	36	46.3	I.	Ec.	Re.
6	6	43		II.	Tr.	In.
	8	38		II.*	Sh.	In.
	9	31		II.	Tr.	Eg.
	11	22		II.	Sh.	Eg.
	15	46		I.	Tr.	In.
	16	44		I.	Sh.	In.
	18	3		I.	Tr.	Eg.
	18	58		I.	Sh.	Eg.
7	8	36		III.	Oc.	Dis.
	11	38		III.	Oc.	Re.
	12	41	54.2	III.	Ec.	Dis.
	12	56		I.	Oc.	Dis.
	15	8	30.8	III.	Ec.	Re.
	16	5	30.5	I.	Ec.	Re.
8	1	52		II.	Oc.	Dis.
	6	26	43.3	II.	Ec.	Re.
	10	16		I.	Tr.	In.
	11	13		I.	Sh.	In.
	12	33		I.	Tr.	Eg.
	13	27		I.	Sh.	Eg.
	14	19		IV.	Oc.	Dis.
	16	33		IV.	Oc.	Re.
9	7	26		I.	Oc.	Dis.
	10	34	9.2	I.	Ec.	Re.
	20	6		II.	Tr.	In.
	21	57		II.	Sh.	In.
	22	54		II.	Tr.	Eg.
10	0	41		II.	Sh.	Eg.
	4	46		I.	Tr.	In.
	5	41		I.	Sh.	In.
	7	3		I.	Tr.	Eg.
	7	56		I.*	Sh.	Eg.
	22	42		III.	Tr.	In.
11	1	42		III.	Tr.	Eg.
	1	56		I.	Oc.	Dis.
	2	30		III.	Sh.	In.
11	5	2	54.6	I.	Ec.	Re.
	5	9		III.	Sh.	Eg.
	15	15		II.	Oc.	Dis.
	19	44	10.9	II.	Ec.	Re.
	23	16		I.	Tr.	In.
12	0	10		I.	Sh.	In.
	1	33		I.	Tr.	Eg.
	2	24		I.	Sh.	Eg.
	20	26		I.	Oc.	Dis.
	23	31	34.1	I.	Ec.	Re.
13	9	30		II.	Tr.	In.
	11	15		II.	Sh.	In.
	12	18		II.	Tr.	Eg.
	13	59		II.	Sh.	Eg.
	17	46		I.	Tr.	In.
	18	38		I.	Sh.	In.
	20	3		I.	Tr.	Eg.
	20	53		I.	Sh.	Eg.
14	12	57		III.	Oc.	Dis.
	14	56		I.	Oc.	Dis.
	15	57		III.	Oc.	Re.
	16	41	7.8	III.	Ec.	Dis.
	18	0	18.0	I.	Ec.	Re.
	19	6	34.2	III.	Ec.	Re.
15	4	38		II.	Oc.	Dis.
	9	1	30.1	II.	Ec.	Re.
	12	16		I.	Tr.	In.
	13	7		I.	Sh.	In.
	14	33		I.	Tr.	Eg.
	15	22		I.	Sh.	Eg.
16	9	26		I.	Oc.	Dis.
	12	28	56.1	I.	Ec.	Re.
	22	36		IV.	Tr.	In.
	22	54		II.	Tr.	In.
17	0	33		II.	Sh.	In.
	0	41		IV.	Tr.	Eg.
	1	42		II.	Tr.	Eg.
	3	17		II.	Sh.	Eg.
	6	46		I.	Tr.	In.
	7	35		I.*	Sh.	In.
	9	3		I.	Tr.	Eg.
	9	50		I.	Sh.	Eg.
18	3	3		III.	Tr.	In.
	3	56		I.	Oc.	Dis.
	6	2		III.	Tr.	Eg.
	6	29		III.	Sh.	In.
	6	57	40.8	I.	Ec.	Re.
	9	6		III.	Sh.	Eg.
	18	1		II.	Oc.	Dis.
	22	18	50.5	II.	Ec.	Re.
19	1	16		I.	Tr.	In.
	2	4		I.	Sh.	In.
	3	33		I.	Tr.	Eg.
	4	19		I.	Sh.	Eg.
	22	26		I.	Oc.	Dis.
20	1	26	19.9	I.	Ec.	Re.
	12	18		II.	Sh.	In.
	13	51		II.	Sh.	In.
	15	6		II.	Tr.	Eg.
	16	35		II.	Sh.	Eg.
	19	46		I.	Tr.	In.
	20	33		I.	Sh.	In.
	22	3		I.	Tr.	Eg.
	22	48		I.	Sh.	Eg.
21	16	56		I.	Oc.	Dis.
21	17	20		III.	Oc.	Dis.
	19	55	3.2	I.	Ec.	Re.
	20	18		III.	Oc.	Re.
	20	40	56.4	III.	Ec.	Dis.
	23	5	12.4	III.	Ec.	Re.
22	7	24		II.*	Oc.	Dis.
	11	36	4.7	II.	Ec.	Re.
	14	16		I.	Tr.	In.
	15	1		I.	Sh.	In.
	16	33		I.	Tr.	Eg.
	17	16		I.	Sh.	Eg.
23	11	27		I.	Oc.	Dis.
	14	23	40.5	I.	Ec.	Re.
24	1	42		II.	Tr.	In.
	3	10		II.	Sh.	In.
	4	30		II.	Tr.	Eg.
	5	54		II.	Sh.	Eg.
	8	46		I.	Tr.	In.
	9	30		I.	Sh.	In.
	11	3		I.	Tr.	Eg.
	11	45		I.	Sh.	Eg.
25	5	57		I.	Oc.	Dis.
	7	26		III.*	Tr.	In.
	8	52	24.9	I.	Ec.	Re.
	10	23		III.	Tr.	Eg.
	10	28		III.	Sh.	In.
	10	33		IV.	Oc.	Dis.
	12	25		IV.	Oc.	Re.
	13	4		III.	Sh.	Eg.
	20	48		II.	Oc.	Dis.
26	0	53	18.7	II.	Ec.	Re.
	3	17		I.	Tr.	In.
	3	59		I.	Sh.	In.
	5	33		I.	Tr.	Eg.
	6	14		I.	Sh.	Eg.
27	0	27		I.	Oc.	Dis.
	3	21	3.3	I.	Ec.	Re.
	15	6		II.	Tr.	In.
	16	28		II.	Sh.	In.
	17	55		II.	Tr.	Eg.
	19	12		II.	Sh.	Eg.
	21	47		I.	Tr.	In.
	22	27		I.	Sh.	In.
28	0	3		I.	Tr.	Eg.
	0	42		I.	Sh.	Eg.
	18	57		I.	Oc.	Dis.
	21	45		III.	Oc.	Dis.
	21	49	46.2	I.	Ec.	Re.
29	3	3	21.8	III.	Ec.	Re.
	10	11		II.	Oc.	Dis.
	14	10	28.5	II.	Ec.	Re.
	16	17		I.	Tr.	In.
	16	56		I.	Sh.	In.
	18	33		I.	Tr.	Eg.
	19	11		I.	Sh.	Eg.
30	13	27		I.	Oc.	Dis.
	16	18	22.5	I.	Ec.	Re.
31	4	31		II.	Tr.	In.
	5	47		II.	Sh.	In.
	7	20		II.*	Tr.	Eg.
	8	30		II.	Sh.	Eg.
	10	47		I.	Tr.	In.
	11	24		I.	Sh.	In.
	13	3		I.	Tr.	Eg.
	13	39		I.	Sh.	Eg.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

AUGUST.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 8ʰ 0ᵐ for an Inverting Telescope.

Day.	West.		East.
1	4· 1	O	· ·2 ·3
2	4·	O	·1 2· 3·
3	4· 2· 1·	O	3·
4	4· 3· ·2	O	·1
5	·4 3· 1·	O	·2
6	O 2· ·4 ·3	O	1·
7	·4 ·2 ·1 ·	O	3
8	·4	O	1· ·2 ·3
9		O	·4 2· 3· ·1 ●
10	2· 1·	O	3· ·4
11	·2 3·	O	·1 ·4
12	3· 1·	O	·2 ·4
13	·3	O	2· ·1 4·
14	2· ·1 ·3	O	4·
15		O	·2 1· ·3 4·
16	·1	O	4· 2· ·3
17	O 1· 2· 4·	O	3·
18	4· ·2 3·	O	·1
19	4· 3· 1·	O	·2
20	4· ·3	O	2· ·1
21	·4 2· ·3 ·1	O	
22	·4	O	1· ·3 ·2 ●
23	·4 ·1	O	2· ·3
24	·4 2· 1	O	· 3·
25	O 3· ·2 ·	O	4 ·1 ●
26	3· 1·	O	·2 ·4
27	·3	O	·1 2· ·4
28	2· ·3 1·	O	·4
29	·2	O	·3 1· ·4
30	·1	O	·2 ·3 4·
31	2·	O	1· 3· 4·

WASHINGTON MEAN TIME.

SEPTEMBER.

d	h	m	s				d	h	m	s				d	h	m	s			
1	7	58		I.	Oc.	Dis.	3	21	48		II.	Sh.	Eg.	7	10	8		II.	Tr.	Eg.
	10	47	6.1	I.	Ec.	Re.		23	47		I.	Tr.	In.		11	7		II.	Sh.	Eg.
	11	50		III.	Tr.	In.	4	0	21		I.	Sh.	In.		12	48		I.	Tr.	In.
	14	26		III.	Sh.	In.		2	3		I.	Tr.	Eg.		13	19		I.	Sh.	In.
	14	46		III.	Tr.	Eg.		2	36		I.	Sh.	Eg.		15	3		I.	Tr.	Eg.
	17	2		III.	Sh.	Eg.		20	58		I.	Oc.	Dis.		15	33		I.	Sh.	Eg.
	23	35		II.	Oc.	Dis.		23	44	25.8	I.	Ec.	Re.	8	9	59		I.	Oc.	Dis.
2	3	27	35.8	II.	Ec.	Re.	5	2	11		III.	Oc.	Dis.		12	41	43.8	I.	Ec.	Re.
	5	17		I.	Tr.	In.		7	1	45.5	III.	Ec.	Re.		16	16		III.	Tr.	In.
	5	53		I.	Sh.	In.		12	58		II.	Oc.	Dis.		18	25		III.	Sh.	In.
	7	33		I.	Tr.	Eg.		16	44	40.1	II.	Ec.	Re.		19	9		III.	Tr.	Eg.
	8	8		I.	Sh.	Eg.		18	18		I.	Tr.	In.		20	59		III.	Sh.	Eg.
	19	2		IV.	Tr.	In.		18	50		I.	Sh.	In.	9	2	22		II.	Oc.	Dis.
	20	41		IV.	Tr.	Eg.		20	33		I.	Tr.	Eg.		6	1	41.5	II.	Ec.	Re.
3	2	28		I.	Oc.	Dis.		21	5		I.	Sh.	Eg.		7	18		I.	Tr.	In.
	5	15	43.7	I.	Ec.	Re.	6	15	29		I.	Oc.	Dis.		7	48		I.	Sh.	In.
	17	55		II.	Tr.	In.		18	13	1.0	I.	Ec.	Re.		9	34		I.	Tr.	Eg.
	19	5		II.	Sh.	In.	7	7	20		II.	Tr.	In.		10	2		I.	Sh.	Eg.
	20	44		II.	Tr.	Eg.		8	24		II.	Sh.	In.							

The satellites are not visible from September 9 to November 7, Jupiter being too near the sun.

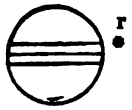
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

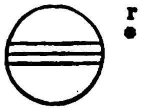
SEPTEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

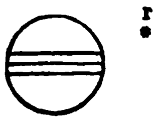
I.



II.



III.



Configurations at 7h 30m for an Inverting Telescope.

Day.	West.		East.
1	·2 ·	○	1 3· 4·
2	3· 1·	○	2 4·
3	3· 4·	○	·1 2·
4	4· ·3 2· 1·	○	
5	4· ·2	○	·3 ·1
6	4· ·1	○	·2 ·3
7	·4 2	○	· 1· 3·
8	·4 ·2 ·1	○	3·
9	○ 1· ·4 3·	○	·2

WASHINGTON MEAN TIME.

NOVEMBER.

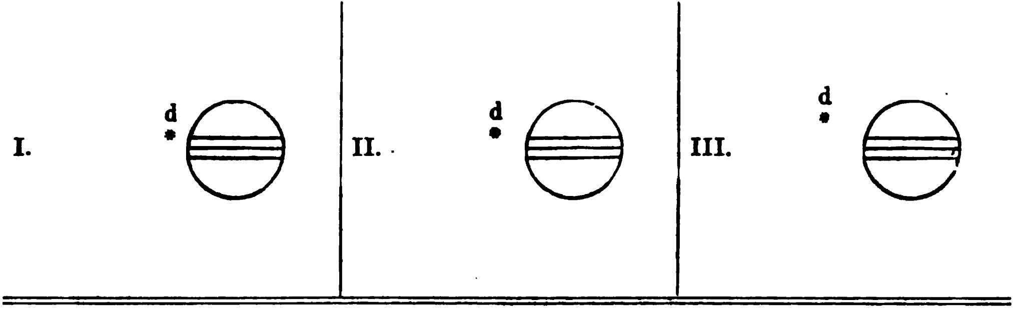
d	h	m	s			
7	14	43	32.6	I.	Ec.	Dis.
	17	24		I. *	Oc.	Re.
8	11	54		I.	Sh.	In.
	12	24		I.	Tr.	In.
	13	11	13.0	II.	Ec.	Dis.
	14	8		I.	Sh.	Eg.
	14	38		I.	Tr.	Eg.
	16	29	0.7	III.	Ec.	Dis.
	16	49		II.	Oc.	Re.
	20	51		III.	Oc.	Re.
9	9	11	58.2	I.	Ec.	Dis.
	11	55		I.	Oc.	Re.
10	6	22		I.	Sh.	In.
	6	54		I.	Tr.	In.
	7	52		II.	Sh.	In.
	8	36		I.	Sh.	Eg.
	8	54		II.	Tr.	In.
	9	8		I.	Tr.	Eg.
	10	33		II.	Sh.	Eg.
	11	36		II.	Tr.	Eg.
11	3	40	31.0	I.	Ec.	Dis.
	6	25		I.	Oc.	Re.
12	0	51		I.	Sh.	In.
	1	24		I.	Tr.	In.
	2	27	50.2	II.	Ec.	Dis.
	3	5		I.	Sh.	Eg.
	3	38		I.	Tr.	Eg.
	6	11		II.	Oc.	Re.
	6	11		III.	Sh.	In.
	8	25		III.	Tr.	In.
	8	35		III.	Sh.	Eg.
	10	52		III.	Tr.	Eg.
	22	8	57.8	I.	Ec.	Dis.
13	0	55		I.	Oc.	Re.
	19	19		I.	Sh.	In.
	19	54		I.	Tr.	In.
	21	10		II.	Sh.	In.
	21	34		I.	Sh.	Eg.
	22	8		I.	Tr.	Eg.
	22	19		II.	Tr.	In.
	23	51		II.	Sh.	Eg.
14	1	0		II.	Tr.	Eg.
	16	37	30.2	I.	Ec.	Dis.
	19	25		I.	Oc.	Re.
15	13	47		I.	Sh.	In.
	14	24		I.	Tr.	In.
	15	44	24.5	II.	Ec.	Dis.
	16	2		I.	Sh.	Eg.
15	16	38		I.	Tr.	Eg.
	19	34		II.	Oc.	Re.
	20	27	13.9	III.	Ec.	Dis.
	22	37	18.5	III.	Ec.	Re.
	22	48		III.	Oc.	Dis.
16	1	13		III.	Oc.	Re.
	11	5	54.4	I.	Ec.	Dis.
	13	55		I.	Oc.	Re.
17	8	16		I.	Sh.	In.
	8	54		I.	Tr.	In.
	10	28		II.	Sh.	In.
	10	30		I.	Sh.	Eg.
	11	8		I.	Tr.	Eg.
	11	44		II.	Tr.	In.
	13	9		II.	Sh.	Eg.
	14	24		II.	Tr.	Eg.
18	5	34	25.4	I.	Ec.	Dis.
	8	25		I.	Oc.	Re.
19	2	44		I.	Sh.	In.
	3	24		I.	Tr.	In.
	4	58		I.	Sh.	Eg.
	5	1	0.0	II.	Ec.	Dis.
	5	38		I.	Tr.	Eg.
	8	57		II.	Oc.	Re.
	10	9		III.	Sh.	In.
	12	32		III.	Sh.	Eg.
	12	50		III.	Tr.	In.
	15	13		III.	Tr.	Eg.
20	0	2	51.3	I.	Ec.	Dis.
	2	55		I.	Oc.	Re.
	21	12		I.	Sh.	In.
	21	54		I.	Tr.	In.
	23	26		I.	Sh.	Eg.
	23	46		II.	Sh.	In.
21	0	8		I.	Tr.	Eg.
	1	8		II.	Tr.	In.
	2	27		II.	Sh.	Eg.
	3	48		II.	Tr.	Eg.
	18	31	22.3	I. *	Ec.	Dis.
	21	25		I.	Oc.	Re.
22	15	41		I.	Sh.	In.
	16	23		I.	Tr.	In.
	17	54		I. *	Sh.	Eg.
	18	17	33.1	II. *	Ec.	Dis.
	18	37		I.	Tr.	Eg.
	22	19		II.	Oc.	Re.
23	0	25	27.9	III.	Ec.	Dis.
	2	34	22.9	III.	Ec.	Re.
23	3	13		III.	Oc.	Dis.
	5	34		III.	Oc.	Re.
	12	59	45.1	I.	Ec.	Dis.
	15	55		I.	Oc.	Re.
24	10	9		I.	Sh.	In.
	10	53		I.	Tr.	In.
	12	22		I.	Sh.	Eg.
	13	4		II.	Sh.	In.
	13	6		I.	Tr.	Eg.
	14	32		II.	Tr.	In.
	15	45		II.	Sh.	Eg.
	17	12		II. *	Tr.	Eg.
25	7	28	14.8	I.	Ec.	Dis.
	10	25		I.	Oc.	Re.
26	4	37		I.	Sh.	In.
	5	22		I.	Tr.	In.
	6	50		I.	Sh.	Eg.
	7	34	7.5	II.	Ec.	Dis.
	7	36		I.	Tr.	Eg.
	11	41		II.	Oc.	Re.
	14	7		III.	Sh.	In.
	16	28		III. *	Sh.	Eg.
	17	14		III. *	Tr.	In.
	19	33		III.	Tr.	Eg.
27	1	56	30.2	I.	Ec.	Dis.
	4	54		I.	Oc.	Re.
	23	6		I.	Sh.	In.
	23	52		I.	Tr.	In.
28	1	19		I.	Sh.	Eg.
	2	6		I.	Tr.	Eg.
	2	22		II.	Sh.	In.
	3	56		II.	Tr.	In.
	5	3		II.	Sh.	Eg.
	6	35		II.	Tr.	Eg.
	20	25	8.6	I.	Ec.	Dis.
	23	24		I.	Oc.	Re.
29	17	34		I. *	Sh.	In.
	18	22		I. *	Tr.	In.
	19	47		I.	Sh.	Eg.
	20	35		I.	Tr.	Eg.
	20	50	40.1	II.	Ec.	Dis.
30	1	3		II.	Oc.	Re.
	4	24	14.5	III.	Ec.	Dis.
	6	32	0.3	III.	Ec.	Re.
	7	37		III.	Oc.	Dis.
	9	55		III.	Oc.	Re.
	14	53	30.5	I.	Ec.	Dis.
	17	54		I. *	Oc.	Re.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

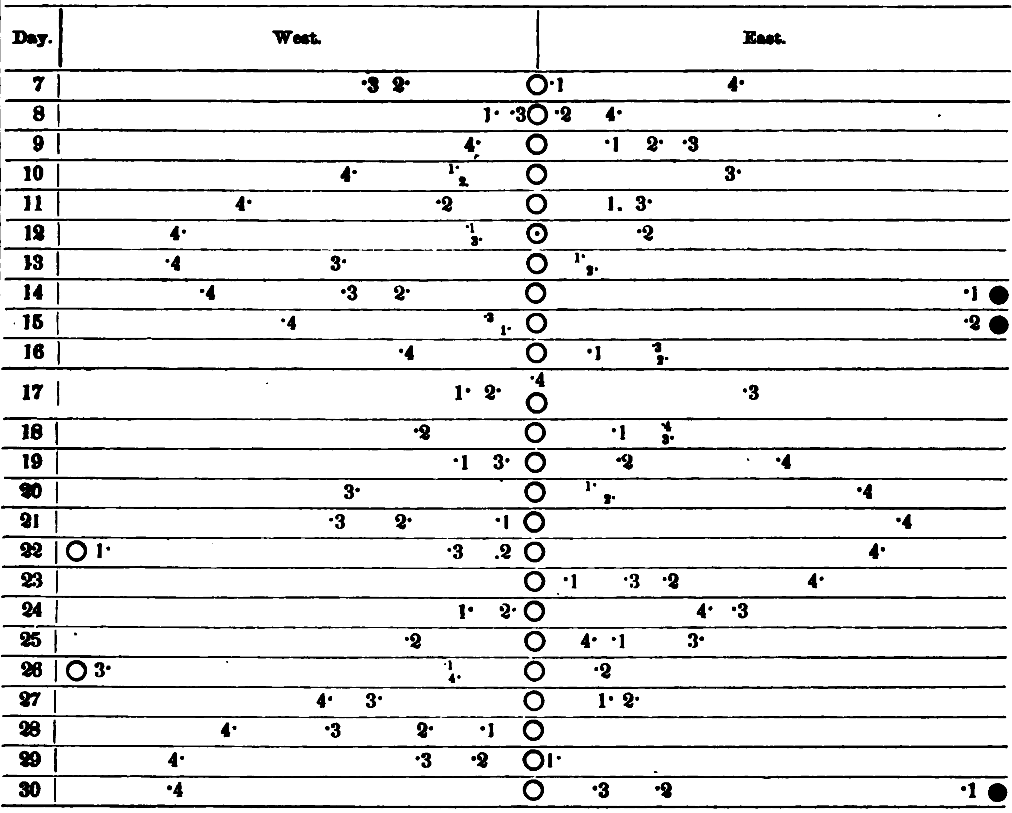
WASHINGTON MEAN TIME.

NOVEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 17h 30m for an Inverting Telescope.



WASHINGTON MEAN TIME.

DECEMBER.

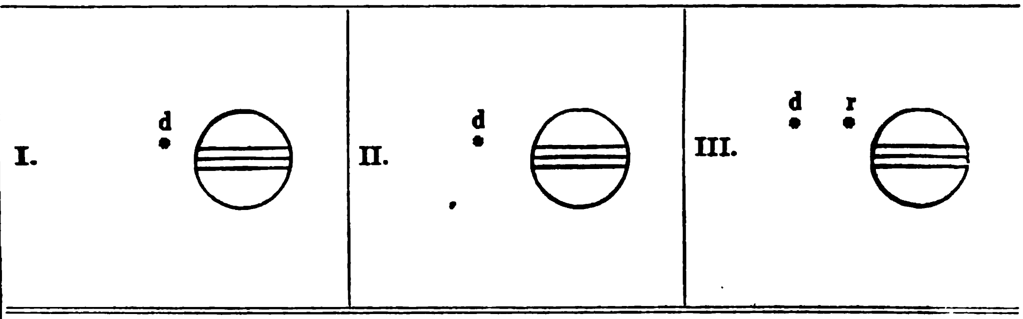
d	h	m	s				d	h	m	s				d	h	m	s			
1	12	2		I.	Sh.	In.	11	5	44	0.2	I.	Ec.	Dis.	21	20	34	18.2	I.	Ec.	Dis.
	12	52		I.	Tr.	In.		8	52		I.	Oc.	Re.		20	36		III.	Oc.	Dis.
	14	15		I.	Sh.	Eg.	12	2	51		I.	Sh.	In.		22	40		III.	Oc.	Re.
	15	5		I.	Tr.	Eg.		3	49		I.	Tr.	In.		23	49		I.	Oc.	Re.
	15	40		II.	Sh.	In.		5	5		I.	Sh.	Eg.	22	17	41		I.*	Sh.	In.
	17	20		II.*	Tr.	In.		6	2		I.	Tr.	Eg.		18	45		I.	Tr.	In.
	18	21		II.*	Sh.	Eg.		7	34		II.	Sh.	In.		19	55		I.	Sh.	Eg.
	19	58		II.	Tr.	Eg.		9	29		II.	Tr.	In.		20	58		I.	Tr.	Eg.
2	9	21	58.9	I.	Ec.	Dis.		10	14		II.	Sh.	Eg.		23	26		II.	Sh.	In.
	12	24		I.	Oc.	Re.		12	7		II.	Tr.	Eg.	23	1	36		II.	Tr.	In.
3	6	30		I.	Sh.	In.	13	0	12	27.5	I.	Ec.	Dis.		2	6		II.	Sh.	Eg.
	7	22		I.	Tr.	In.		3	22		I.	Oc.	Re.		4	12		II.	Tr.	Eg.
	8	44		I.	Sh.	Eg.		21	20		I.	Sh.	In.		15	2	42.8	I.*	Ec.	Dis.
	9	35		I.	Tr.	Eg.		22	19		I.	Tr.	In.		18	18		I.*	Oc.	Re.
	10	7	14.1	II.	Ec.	Dis.		23	34		I.	Sh.	Eg.	24	12	10		I.	Sh.	In.
	14	25		II.	Oc.	Re.	14	0	32		I.	Tr.	Eg.		13	15		I.	Tr.	In.
	18	4		III.*	Sh.	In.		1	56	54.8	II.	Ec.	Dis.		14	23		I.	Sh.	Eg.
	20	25		III.	Sh.	Eg.		6	29		II.	Oc.	Re.		15	28		I.*	Tr.	Eg.
	21	35		III.	Tr.	In.		12	20	52.2	III.	Ec.	Dis.		17	46	39.0	II.*	Ec.	Dis.
	23	51		III.	Tr.	Eg.		14	26	20.0	III.	Ec.	Re.		22	31		II.	Oc.	Re.
4	3	50	22.2	I.	Ec.	Dis.		16	19		III.*	Oc.	Dis.	25	5	58		III.	Sh.	In.
	6	54		I.	Oc.	Re.		18	28		III.*	Oc.	Re.		8	15		III.	Sh.	Eg.
5	0	58		I.	Sh.	Iu.		18	40	47.0	I.*	Ec.	Dis.		9	31	2.3	I.	Ec.	Dis.
	1	51		I.	Tr.	In.		21	51		I.	Oc.	Re.		10	30		III.	Tr.	In.
	3	12		I.	Sh.	Eg.	15	15	48		I.*	Sh.	In.		12	32		III.	Tr.	Eg.
	4	4		I.	Tr.	Eg.		16	48		I.*	Tr.	In.		12	47		I.	Oc.	Re.
	4	58		II.	Sh.	In.		18	3		I.*	Sh.	Eg.	26	6	39		I.	Sh.	In.
	6	43		II.	Tr.	In.		19	1		I.	Tr.	Eg.		7	44		I.	Tr.	In.
	7	39		II.	Sh.	Eg.		20	51		II.	Sh.	In.		8	51		I.	Sh.	Eg.
	9	22		II.	Tr.	Eg.		22	52		II.	Tr.	In.		9	57		I.	Tr.	Eg.
	22	18	50.5	I.	Ec.	Dis.		23	31		II.	Sh.	Eg.		12	44		II.	Sh.	In.
6	1	23		I.	Oc.	Re.	16	1	29		II.	Tr.	Eg.		14	57		II.*	Tr.	In.
	19	26		I.	Sh.	In.		13	9	13.1	I.	Ec.	Dis.		15	24		II.*	Sh.	Eg.
	20	21		I.	Tr.	In.		16	21		I.*	Oc.	Re.		17	33		II.*	Tr.	Eg.
	21	40		I.	Sh.	Eg.	17	10	16		I.	Sh.	In.	27	3	59	27.4	I.	Ec.	Dis.
	22	34		I.	Tr.	Eg.		11	17		I.	Tr.	In.		7	17		I.	Oc.	Re.
	23	23	46.9	II.	Ec.	Dis.		12	31		I.	Sh.	Eg.	28	1	7		I.	Sh.	In.
7	3	47		II.	Oc.	Re.		13	30		I.	Tr.	Eg.		2	13		I.	Tr.	In.
	8	22	28.2	III.	Ec.	Dis.		15	13	28.8	II.*	Ec.	Dis.		3	19		I.	Sh.	Eg.
	10	29	5.0	III.	Ec.	Re.		19	50		II.	Oc.	Re.		4	26		I.	Tr.	Eg.
	11	59		III.	Oc.	Dis.	18	1	59		III.	Sh.	In.		7	3	17.7	II.	Ec.	Dis.
	14	12		III.	Oc.	Re.		4	18		III.	Sh.	Eg.		11	51		II.	Oc.	Re.
	16	47	11.2	I.*	Ec.	Dis.		6	13		III.	Tr.	In.		20	16	15.6	III.	Ec.	Dis.
	19	53		I.	Oc.	Re.		7	37	33.5	I.	Ec.	Dis.		22	19	25.2	III.	Ec.	Re.
8	13	55		I.	Sh.	In.		8	20		III.	Tr.	Eg.		22	27	44.8	I.	Ec.	Dis.
	14	50		I.	Tr.	In.		10	50		I.	Oc.	Re.	29	0	50		III.	Oc.	Dis.
	16	9		I.*	Sh.	Eg.	19	4	45		I.	Sh.	In.		1	46		I.	Oc.	Re.
	17	3		I.*	Tr.	Eg.		5	47		I.	Tr.	In.		2	50		III.	Oc.	Re.
	18	16		II.*	Sh.	In.		6	59		I.	Sh.	Eg.		19	35		I.	Sh.	In.
	20	6		II.	Tr.	In.		8	0		I.	Tr.	Eg.		20	42		I.	Tr.	In.
	20	57		II.	Sh.	Eg.		10	9		II.	Sh.	In.		21	48		I.	Sh.	Eg.
	22	45		II.	Tr.	Eg.		12	14		II.	Tr.	In.		22	55		I.	Tr.	Eg.
9	11	15	38.3	I.	Ec.	Dis.		12	49		II.	Sh.	Eg.	30	2	1		II.	Sh.	In.
	14	23		I.	Oc.	Re.		14	51		II.	Tr.	Eg.		4	18		II.	Tr.	In.
10	8	23		I.	Sh.	In.	20	2	5	59.6	I.	Ec.	Dis.		4	41		II.	Sh.	Eg.
	9	20		I.	Tr.	In.		5	19		I.	Oc.	Re.		6	54		II.	Tr.	Eg.
	10	37		I.	Sh.	Eg.		23	13		I.	Sh.	In.		16	56	8.1	I.*	Ec.	Dis.
	11	33		I.	Tr.	Eg.	21	0	16		I.	Tr.	In.		20	15		I.	Oc.	Re.
	12	40	21.2	II.	Ec.	Dis.		1	27		I.	Sh.	Eg.	31	14	3		I.	Sh.	In.
	17	8		II.*	Oc.	Re.		2	29		I.	Tr.	Eg.		15	11		I.*	Tr.	In.
	22	2		III.	Sh.	In.		4	30	4.2	II.	Ec.	Dis.		16	16		I.*	Sh.	Eg.
11	0	21		III.	Sh.	Eg.		9	10		II.	Oc.	Re.		17	24		I.*	Tr.	Eg.
	1	55		III.	Tr.	In.		16	18	39.1	III.*	Ec.	Dis.		20	19	53.1	II.	Ec.	Dis.
	4	7		III.	Tr.	Eg.		18	22	57.7	III.*	Ec.	Re.							

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; *Visible at Washington.

WASHINGTON MEAN TIME.

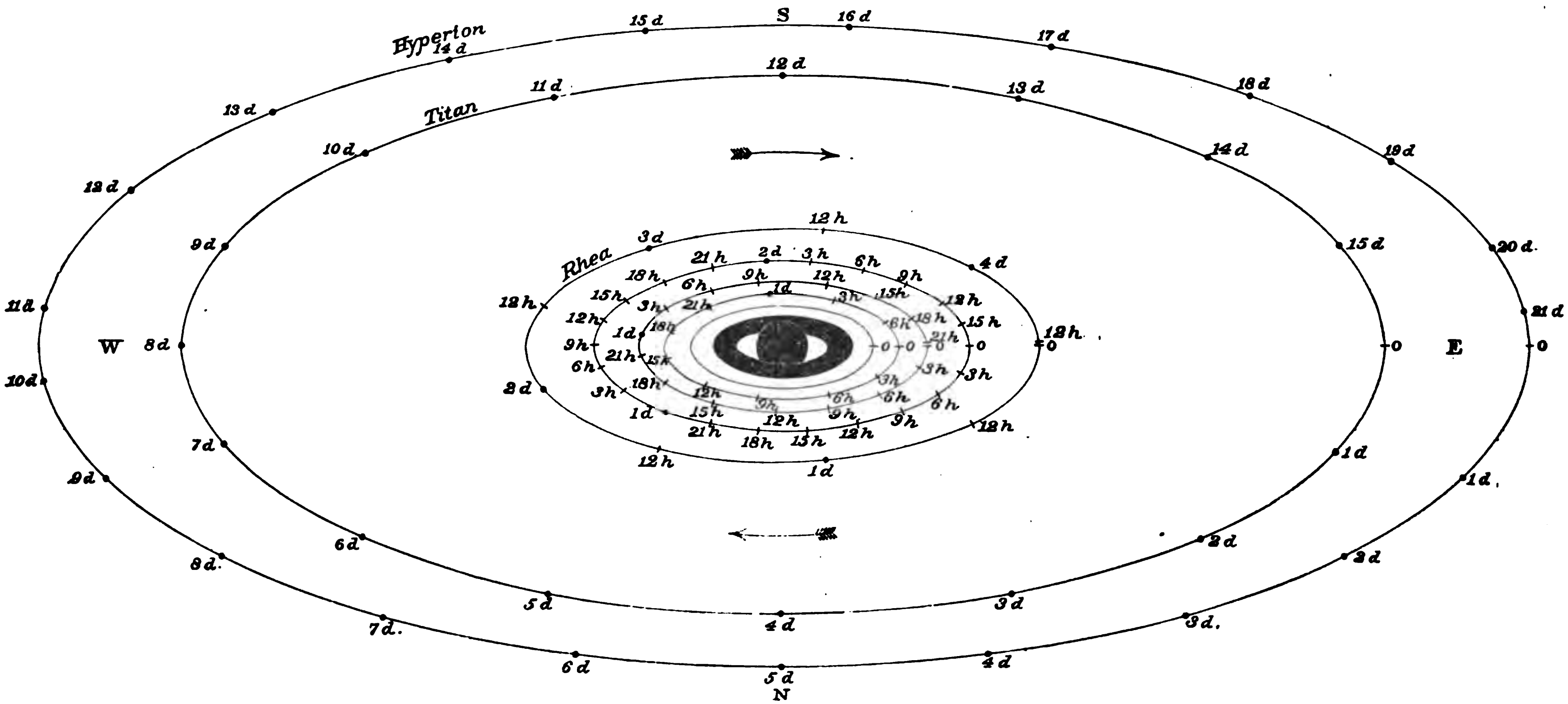
DECEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 17h 0m for an Inverting Telescope.

Day.	West.		East.
1	·4 1·	2O ·	·3
2	·4 2·	O	·1 3·
3	·4 1·	O	2 3·
4	3·	O	·4 1· 2·
5	3· · 2· ·1	O	·4
6	·3 ·2	O	1·
7		·1O	·3 ·2 ·4
8	O 1·	O	2· ·3 ·4
9	2·	O	·1 3· 4·
10	1·	O	3· 4· ·2 ●
11	3·	O	·1 2· 4·
12	3· ·1 2·	O	4·
13	·3 2 4·	O	1·
14	4· ·1	O	·2 ·3 ●
15	O 1· 4·	O	2· ·3
16	4· 2·	O	·1 3·
17	·4 1·	·O2	3·
18	·4 3·	O	·1 2·
19	·4 3· 1· 2·	O	
20	·3 2 ·4	O	1·
21	·1 ·3	O	·4 ·2
22		O	1· 2· ·3 ·4
23	2·	O	3· ·4 ·1 ●
24	2 1·	O	3· ·4
25	3·	O	·1 ·2 4·
26	O 2· 3· 1·	O	4·
27	·3 ·2	O	1· 4·
28	·1 3	O	·2 4·
29		O 4·	1· 2· 3
30	4· 2·	·1O	·3
31	O 1· 4· ·2	O	3·



Names of the Satellites.

I.	Mimas.
II.	Enceladus.
III.	Tethys.
IV.	Dione.
V.	Rhea.
VI.	Titan.
VII.	Hyperion.
VIII.	Japetus.

APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN IN 1885 AND 1886, AS SEEN IN AN INVERTING TELESCOPE.

Mean Synodic Periods.

	d	h
I.	0	22.6
II.	1	8.9
III.	1	21.3
IV.	2	17.7
V.	4	12.5
VI.	15	23.3
VII.	21	7.8
VIII.	79	22.0

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WASHINGTON MEAN TIMES OF ELONGATION, ETC.

In the diagram on the preceding page, the points of the orbits marked "o" are those of the eastern elongation, as seen in an inverting telescope. The apparent positions of a satellite at any time may be marked on the diagram by counting around the orbit the interval in days and hours which has elapsed since the last east elongation. The times of these elongations may be found from the following tables. Mimas can be seen only within a few hours of each elongation: the time of every elongation visible at Washington is therefore given. The times of other elongations of any satellite in the same direction may be found by adding or subtracting any multiple of the period. For the three outer satellites the times of elongation and conjunction are given. The following abbreviations are used:—

E., East Elongation,
I., Inferior Conjunction (north of planet),
W., West Elongation,
S., Superior Conjunction (south of planet).

MIMAS.

Elongations Visible at Washington.

	d	h			d	h			d	h			d	h			d	h			d	h	
Jan.	3	11.3	E.	Feb.	5	10.7	E.	Mar.	10	10.4	E.	Oct.	5	17.2	E.	Nov.	10	12.8	E.	Dec.	12	13.9	E.
	4	10.0	E.		6	9.3	E.		11	9.0	E.		6	15.8	E.		11	11.4	E.		13	12.5	E.
	5	8.6	E.		7	7.9	E.		12	7.6	E.		7	14.4	E.		12	10.0	E.		14	11.1	E.
	6	7.2	E.		8	6.5	E.		13	6.2	E.		8	13.1	E.		17	14.4	W.		15	9.7	E.
	7	5.8	E.		13	10.9	W.		18	10.7	W.		13	17.5	W.		18	13.0	W.		16	8.3	E.
	11	11.5	W.		14	9.6	W.		19	9.3	W.		14	16.1	W.		19	11.7	W.		17	6.9	E.
	12	10.1	W.		15	8.2	W.		20	7.9	W.		15	14.7	W.		20	10.3	W.		18	5.5	E.
	13	8.7	W.		16	6.8	W.		21	6.5	W.		16	13.3	W.		21	8.9	W.		21	12.7	W.
	14	7.3	W.		17	5.4	W.		27	9.5	E.		22	16.4	E.		25	14.6	E.		22	11.3	W.
	15	5.9	W.		21	11.2	E.		28	8.1	E.		23	15.0	E.		26	13.2	E.		23	9.9	W.
	19	11.6	E.		22	9.9	E.		29	6.8	E.		24	13.6	E.		27	11.9	E.		24	8.5	W.
	20	10.2	E.		23	8.5	E.	Apr	4	9.8	W.		25	12.2	E.		28	10.5	E.		25	7.1	W.
	21	8.8	E.		24	7.2	E.		5	8.4	W.		30	16.7	W.		29	9.2	E.		26	5.7	W.
	22	7.5	E.		25	5.8	E.		6	7.0	W.		31	15.3	W.	Dec.	4	13.6	W.		29	12.8	E.
	23	6.1	E.	Mar.	1	11.5	W.		12	10.1	E.	Nov.	1	13.9	W.		5	12.2	W.		30	11.4	E.
	28	10.5	W.		2	10.1	W.		13	8.7	E.		2	12.5	W.		6	10.8	W.		31	10.0	E.
	29	9.1	W.		3	8.7	W.		14	7.3	E.		7	10.9	E.		7	9.4	W.	1887			
	30	7.7	W.		4	7.3	W.		21	9.1	W.		8	15.5	E.		8	8.1	W.	Jan.	1	8.6	E.
	31	6.4	W.		5	6.0	W.		22	7.7	W.		9	14.1	E.		9	6.7	W.		2	7.2	E.

ENCELADUS.

	d	h			d	h			d	h			d	h			d	h			d	h	
Jan.	1	20.5	E.	Jan.	15	13.5	E.	Jan.	29	6.2	E.	Feb.	11	23.0	E.	Feb.	25	15.9	E.	Mar.	11	8.7	E.
	3	5.4	E.		16	22.4	E.		30	15.1	E.		13	7.9	E.		27	0.7	E.		12	17.6	E.
	4	14.4	E.		18	7.2	E.	Feb.	1	0.0	E.		14	16.8	E.		28	9.6	E.		14	2.5	E.
	5	23.4	E.		19	16.1	E.		2	8.9	E.		16	1.7	E.	Mar.	1	18.5	E.		15	11.4	E.
	7	8.3	E.		21	0.9	E.		3	17.8	E.		17	10.6	E.		3	3.4	E.		16	20.3	E.
	8	17.2	E.		22	9.8	E.		5	2.7	E.		18	19.5	E.		4	12.3	E.		18	5.2	E.
	10	2.0	E.		23	18.7	E.		6	11.5	E.		20	4.4	E.		5	21.2	E.		19	14.1	E.
	11	10.9	E.		25	3.6	E.		7	20.4	E.		21	13.3	E.		7	6.0	E.		20	23.0	E.
	12	19.7	E.		26	12.5	E.		9	5.2	E.		22	22.1	E.		8	14.9	E.		22	7.8	E.
	14	4.6	E.		27	21.4	E.		10	14.1	E.		24	7.0	E.		9	23.8	E.		23	16.7	E.

WASHINGTON MEAN TIMES OF EAST ELONGATIONS.

ENCELADUS—(*Concluded.*)

	d	h		d	h		d	h		d	h		d	h		d	h
Mar.	25	1.6 E.	Apr.	14	15.0 E.	Oct.	18	1.3 E.	Nov.	7	14.7 E.	Nov.	28	4.0 E.	Dec.	18	17.1
	26	10.5 E.		15	23.9 E.		19	10.2 E.		8	23.6 E.		29	12.9 E.		20	2.0
	27	19.4 E.		17	8.8 E.		20	19.1 E.		10	8.4 E.		30	21.7 E.		21	10.8
	29	4.3 E.		18	17.6 E.		22	4.0 E.		11	17.3 E.	Dec.	2	6.6 E.		22	19.7
	30	13.2 E.		20	2.5 E.		23	12.9 E.		13	2.2 E.		3	15.5 E.		24	4.6
	31	22.1 E.		21	11.4 E.		24	21.8 E.		14	11.1 E.		5	0.3 E.		25	13.5
Apr.	2	7.0 E.		22	20.3 E.		26	6.7 E.		15	20.0 E.		6	9.2 E.		26	22.4
	3	15.9 E.		24	5.2 E.		27	15.5 E.		17	4.9 E.		7	18.0 E.		28	7.2
	5	0.7 E.		25	14.2 E.		29	0.4 E.		18	13.8 E.		9	2.9 E.		29	16.1
	6	9.6 E.					30	9.3 E.		19	22.7 E.		10	11.8 E.		31	1.0
	7	18.5 E.	Oct.	11	4.9 E.		31	18.2 E.		21	7.6 E.		11	20.7 E.	1887		
	9	3.4 E.		12	13.8 E.	Nov.	2	3.1 E.		22	16.5 E.		13	5.6 E.	Jan.	1	9.8
	10	12.3 E.		13	22.6 E.		3	12.0 E.		24	1.3 E.		14	14.4 E.		2	18.7
	11	21.2 E.		15	7.5 E.		4	20.9 E.		25	10.2 E.		15	23.3 E.		4	3.5
	13	6.1 E.		16	16.4 E.		6	5.8 E.		26	19.1 E.		17	8.2 E.		5	12.4

TETHYS.

	d	h		d	h		d	h		d	h		d	h		d	h
Jan.	1	14.1 E.	Feb.	8	8.1 E.	Mar.	18	2.2 E.	Apr.	24	20.7 E.	Oct.	28	20.7 E.	Dec.	5	14.7 E.
	3	11.5 E.		10	5.4 E.		19	23.5 E.		26	18.1 E.		30	18.0 E.		7	12.0 E.
	5	8.8 E.		12	2.7 E.		21	20.8 E.		28	15.4 E.	Nov.	1	15.3 E.		9	9.3 E.
	7	6.2 E.		14	0.1 E.		23	18.2 E.					3	12.6 E.		11	6.6 E.
	9	3.5 E.		15	21.4 E.		25	15.5 E.					5	9.9 E.		13	3.9 E.
	11	0.8 E.		17	18.7 E.		27	12.9 E.	Sept.	30	13.0 E.		7	7.2 E.		15	1.2 E.
	12	22.1 E.		19	16.0 E.		29	10.2 E.	Oct.	2	10.3 E.		9	4.6 E.		16	22.6 E.
	14	19.4 E.		21	13.4 E.		31	7.6 E.		4	7.6 E.		11	1.9 E.		18	19.9 E.
	16	16.7 E.		23	10.7 E.	Apr.	2	4.9 E.		6	5.0 E.		12	23.3 E.		20	17.2 E.
	18	14.0 E.		25	8.0 E.		4	2.2 E.		8	2.3 E.		14	20.6 E.		22	14.5 E.
	20	11.3 E.		27	5.3 E.		5	23.5 E,		9	23.6 E.		16	17.9 E.		24	11.7 E.
	22	8.5 E.	Mar.	1	2.5 E.		7	20.8 E.		11	20.9 E.		18	15.2 E.		26	9.0 E.
	24	5.8 E.		2	23.8 E.		9	18.1 E.		13	18.2 E.		20	12.4 E.		28	6.3 E.
	26	3.1 E.		4	21.1 E.		11	15.4 E.		15	15.5 E.		22	9.7 E.		30	3.6 E.
	28	0.4 E.		6	18.4 E.		13	12.7 E.		17	12.8 E.		24	7.0 E.	1887		
	29	21.7 E.		8	15.8 E.		15	10.1 E.		19	10.1 E.		26	4.3 E.	Jan.	1	0.9 E.
	31	19.0 E.		10	13.1 E.		17	7.4 E.		21	7.5 E.		28	1.6 E.		2	22.2 E.
Feb.	2	16.3 E.		12	10.4 E.		19	4.7 E.		23	4.8 E.		29	22.9 E.		4	19.5 E.
	4	13.6 E.		14	7.7 E.		21	2.0 E.		25	2.1 E.	Dec.	1	20.1 E.		6	16.8 E.
	6	10.8 E.		16	4.9 E.		22	23.4 E.		26	23.4 E.		3	17.4 E.			

DIONE.

	d	h		d	h		d	h		d	h		d	h		d	h
Jan.	2	21.7 E.	Feb.	4	17.7 E.	Mar.	9	13.8 E.	Apr.	11	10.3 E.	Oct.	28	9.3 E.	Nov.	30	5.4 E.
	5	15.4 E.		7	11.4 E.		12	7.5 E.		14	4.0 E.		31	3.0 E.	Dec.	2	23.1 E.
	8	9.1 E.		10	5.0 E.		15	1.2 E.		16	21.7 E.	Nov.	2	20.7 E.		5	16.7 E.
	11	2.7 E.		12	22.7 E.		17	18.9 E.		19	15.4 E.		5	14.4 E.		8	10.4 E.
	13	20.4 E.		15	16.4 E.		20	12.6 E.					8	8.1 E.		11	4.1 E.
	16	14.0 E.		18	10.0 E.		23	6.3 E.	Oct.	9	5.4 E.		11	1.8 E.		13	21.7 E.
	19	7.7 E.		21	3.7 E.		26	0.0 E.		11	23.1 E.		13	19.5 E.		16	15.3 E.
	22	1.3 E.		23	21.4 E.		28	17.7 E.		14	16.8 E.		16	13.1 E.		19	9.0 E.
	24	19.0 E.		26	15.1 E.		31	11.4 E.		17	10.5 E.		19	6.8 E.		22	2.7 E.
	27	12.7 E.	Mar.	1	8.8 E.	Apr.	3	5.1 E.		20	4.2 E.		22	0.5 E.		24	20.4 E.
	30	6.3 E.		4	2.5 E.		5	22.8 E.		22	21.9 E.		24	18.2 E.		27	14.1 E.
Feb.	2	0.0 E.		6	20.2 E.		8	16.5 E.		25	15.6 E.		27	11.8 E.		30	7.7 E.

RHEA.					
	d	h		d	h
Jan.	4	12.5 E.	Oct.	2	19.8 E.
	9	1.0 E.		7	8.4 E.
	13	13.5 E.		11	20.9 E.
	18	1.9 E.		16	9.3 E.
	22	14.2 E.		20	21.8 E.
	27	2.6 E.		25	10.3 E.
	31	14.9 E.		29	22.7 E.
Feb.	5	3.2 E.	Nov.	3	11.2 E.
	9	15.6 E.		7	23.6 E.
	14	3.9 E.		12	12.0 E.
	18	16.3 E.		17	0.5 E.
	23	4.7 E.		21	12.9 E.
	27	17.1 E.		26	1.2 E.
Mar.	4	5.6 E.		30	13.6 E.
	8	18.0 E.	Dec.	5	2.0 E.
	13	6.4 E.		9	14.3 E.
	17	18.9 E.		14	2.6 E.
	22	7.4 E.		18	14.9 E.
	26	19.8 E.		23	3.1 E.
	31	8.3 E.		27	15.5 E.
Apr.	4	20.8 E.	1887		
	9	9.3 E.	Jan.	1	3.8 E.
	13	21.7 E.		5	16.1 E.
	18	10.2 E.			

TITAN.					
	d	h		d	h
Jan.	2	12.0 S.	Oct.	1	11.4 S.
	6	12.0 E.		5	11.5 E.
	10	12.0 I.		9	11.6 I.
	14	11.8 W.		13	11.7 W.
	18	11.3 S.		17	11.6 S.
	22	10.7 E.		21	11.5 E.
	26	10.3 I.		25	11.2 I.
	30	9.8 W.		29	11.0 W.
Feb.	3	9.4 S.	Nov.	2	10.8 S.
	7	9.0 E.		6	10.5 E.
	11	8.5 I.		10	10.0 I.
	15	8.0 W.		14	9.6 W.
	19	7.5 S.		18	9.1 S.
	23	7.0 E.		22	8.7 E.
	27	6.4 I.		26	8.2 I.
Mar.	3	5.8 W.		30	7.6 W.
	7	5.3 S.	Dec.	4	7.0 S.
	11	5.0 E.		8	6.4 E.
	15	4.8 I.		12	6.0 I.
	19	4.6 W.		16	5.5 W.
	23	4.4 S.		20	5.0 S.
	27	4.5 E.		24	4.5 E.
	31	4.6 I.		28	3.8 I.
Apr.	4	4.6 W.		32	3.0 W.

HYPERION.					
	d	h		d	h
Jan.	2	21.0 S.	Sep.	16	11.0 S.
	8	5.0 E.		21	19.0 E.
	13	13.0 I.		27	3.1 I.
	18	21.0 W.	Oct.	2	11.2 W.
	24	4.9 S.		7	19.5 S.
	29	12.6 E.		13	3.8 E.
Feb.	3	20.0 I.		18	12.0 I.
	9	3.2 W.		23	20.0 W.
	14	10.5 S.		29	3.9 S.
	19	18.0 E.	Nov.	3	11.7 E.
	25	1.5 I.		8	19.3 I.
Mar.	2	8.8 W.		14	2.5 W.
	7	16.0 S.		19	9.8 S.
	12	23.5 E.		24	17.2 E.
	18	7.5 I.		30	0.6 I.
	23	15.8 W.	Dec.	5	8.0 W.
	29	0.0 S.		10	15.6 S.
Apr.	3	8.0 E.		15	23.0 E.
	8	16.2 I.		21	6.0 I.
	14	0.3 W.		26	12.9 W.
	19	8.4 S.		31	19.8 S.
	24	16.5 E.	1887		
	30	0.5 I.	Jan.	6	2.8 E.
May	5	8.5 W.			

JAPETUS						
	Inferior Conjunction .	January 1	March 22	June 11	September 1	November 20
	West Elongation . .	January 20	April 11	July 2	September 21	December 10
	Superior Conjunction .	February 10	May 1	July 23	October 11	December 29
	East Elongation . .	March 2	May 22	August 12	October 31	

THE APPARENT ELEMENTS OF SATURN'S RINGS.

Greenwich Mean Noon.		*a* Outer Major Axis.	*b* Outer Minor Axis.	*p* Inclination of Northern Semi-Minor Axis to Circle of Declination from North to East.	*l* The Elevation of the Earth above the Plane of the Ring.	*l′* The Elevation of the Sun above the Plane of the Ring.	*u* Earth's Longitude from Saturn counted on Plane of Ring from the Ring's Ascending Node on Equator.	*u′* Ecliptic.
Jan.	0	46″.61	20″.49	− 6° 39′.0	− 26° 4′.6	− 26° 4′.6	151° 4′.6	108° 26′.4
	20	46.13	20.51	6 32.6	26 23.7	25 59.5	149 23.6	106 45.5
Feb.	9	44.95	20.12	6 27.8	26 35.5	25 54.0	148 11.2	105 33.2
Mar.	1	43.46	19.53	6 25.9	26 42.2	25 48.1	147 42.8	105 4.9
	21	41.88	18.84	6 27.5	26 43.3	25 42.0	148 3.6	105 25.7
Apr.	10	40.40	18.09	− 6 32.4	− 26 36.5	− 25 35.7	149 11.3	106 23.5
	30	39.15	17.45	6 39.5	26 27.9	25 29.2	150 58.6	108 20.9
May	20	38.21	16.86	6 47.9	26 10.6	25 22.2	153 15.8	110 38.2
June	9	37.60	16.36	6 56.6	25 47.6	25 15.1	155 52.8	113 15.3
	29	37.35	15.97	7 4.1	25 19.0	25 7.8	158 39.7	116 2.3
July	19	37.43	15.69	− 7 11.6	− 24 46.8	− 25 0.0	161 27.3	118 49.9
Aug.	8	37.87	15.53	7 17.0	24 13.1	24 52.0	164 6.4	121 27.1
	28	38.67	15.51	7 21.0	23 39.8	24 43.9	166 28.4	123 51.2
Sept.	17	39.77	15.66	7 23.6	23 11.5	24 35.4	168 24.4	125 47.3
Oct.	7	41.14	15.98	7 25.0	22 51.0	24 26.6	169 46.2	127 9.2
	27	42.69	16.46	− 7 25.7	− 22 40.9	− 24 17.5	170 26.2	127 49.2
Nov.	16	44.23	17.09	7 25.7	22 43.9	24 8.3	170 20.6	127 43.7
Dec.	6	45.53	17.78	7 25.0	22 59.5	23 59.0	169 30.2	126 53.4
	26	46.35	18.41	7 23.5	23 24.3	23 49.3	168 5.0	125 28.3
	31	46.46	18.54	− 7 23.0	− 23 31.3	− 23 46.9	167 40.6	125 4.0

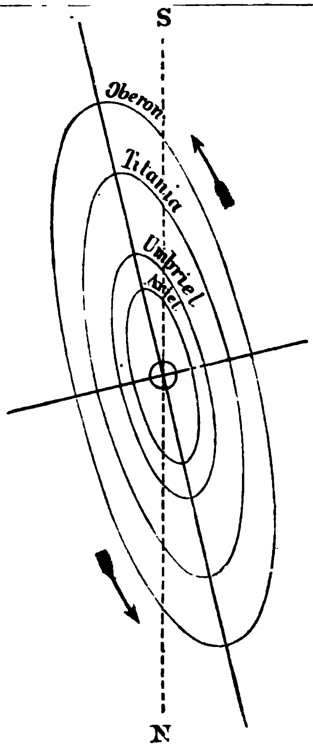
The factor to be multiplied by *a* and *b* to obtain the axes of—

The inner ellipse of the outer ring = 0.8801 log factor = 9.9445
The outer ellipse of the inner ring = 0.8599 log factor = 9.9344
The inner ellipse of the inner ring = 0.6650 log factor = 9.8228
The inner ellipse of the dusky ring = 0.5486 log factor = 9.7392

NOTE.—The negative sign of *l* indicates that the visible surface of the ring is the southern one.

Date.	Position Angle.	App. Distances. Ariel.	App. Distances. Umbriel.
	°	"	"
Jan.	15.2	14.2	19.7
Mar.	15.3	15.3	21.3
June	15.3	14.8	20.6
Dec.	14.9	14.0	19.5

Date.	Position Angle.	App. Distances. Titania.	App. Distances. Oberon.
	°	"	"
Jan.	15.2	32.4	43.3
Mar.	15.3	34.9	46.7
June	15.3	33.8	45.3
Dec.	14.9	32.0	42.8



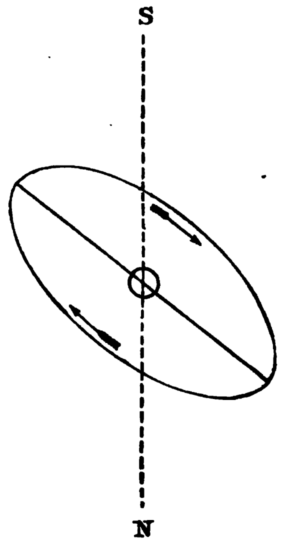
APPARENT ORBITS OF THE SATELLITES OF URANUS IN 1886, AS SEEN IN AN INVERTING TELESCOPE.

WASHINGTON MEAN TIMES OF ELONGATIONS.

TITANIA.						UMBRIEL.						ARIEL.						OBERON.			
North.			South.			North.			South.			North.			South.			North and South.			
	d	h		d	h		d	h		d	h		d	h		d	h		d	h	
Jan.	5	12.3	Jan.	6	18.5				Jan.	1	14.5	Jan.	1	21.2	Jan.	6	5.7	Jan.	6	14.3	S.
	13	1.8		14	8.0	Jan.	7	19.7		9	21.4		10	14.1		14	22.6		13	7.9	N.
	20	15.3		21	21.5		16	2.6		18	4.3		19	7.1		23	15.6		20	1.4	S.
	28	4.7		29	10.9		24	9.5		26	11.2		28	0.0	Feb.	1	8.5		26	19.0	N.
Feb.	4	18.2	Feb.	6	0.4	Feb.	1	16.4	Feb.	3	18.1	Feb.	5	17.0		10	1.5	Feb.	2	12.6	S.
	12	7.7		13	13.9		9	23.3		12	1.0		14	9.9		18	18.4		9	6.1	N.
	19	21.1		21	3.3		18	6.2		20	7.9		23	2.8		27	11.3		15	23.7	S.
	27	10.5		28	16.7		26	13.1		28	14.8	Mar.	3	19.8	Mar.	8	4.3		22	17.2	N.
Mar.	7	0.0	Mar.	8	6.2	Mar.	6	20.0	Mar.	8	21.7		12	12.7		16	21.2	Mar.	1	10.8	S.
	14	13.4		15	19.6		15	2.9		17	4.6		21	5.6		25	14.1		8	4.3	N.
	22	2.9		23	9.1		23	9.8		25	11.5		29	22.5	Apr.	3	7.0		14	21.9	S.
	29	16.3		30	22.5		31	16.7	Apr.	2	18.4	Apr.	7	15.5		12	0.0		21	15.4	N.
Apr.	6	5.8	Apr.	7	12.0	Apr.	8	23.7		11	1.4		16	8.4		20	16.9		28	9.0	S.
	13	19.3		15	1.5		17	6.6		19	8.3		25	1.4		29	9.8	Apr.	4	2.5	N.
	21	8.8		22	15.0		25	13.5		27	15.2	May	3	18.3	May	8	2.8		10	20.1	S.
	28	22.2		30	4.4	May	3	20.4	May	5	22.1		12	11.3		16	19.8		17	13.6	N.
May	6	11.7	May	7	17.9		12	3.3		14	5.0		21	4.3		25	12.8		24	7.2	S.
	14	1.2		15	7.4		20	10.3		22	12.0		29	21.2	June	3	5.7	May	1	0.8	N.
	21	14.7		22	20.9		28	17.2		30	18.9	June	7	14.2		11	22.7		7	18.3	S.
	29	4.2		30	10.4	June	6	0.2	June	8	1.9		16	7.2		20	15.6		14	11.9	N.
June	5	17.7	June	6	23.9	Nov.	27	1.5	Nov.	29	3.2	Nov.	28	16.5	Dec.	3	1.0		21	5.4	S.
Dec.	6	17.3	Dec.	7	23.5	Dec.	5	8.4	Dec.	7	10.1	Dec.	7	9.5		11	18.0	Dec.	15	21.2	N.
	14	6.7		15	12.9		13	15.3		15	17.0		16	2.4		20	10.9		22	14.8	S.
	21	20.1		23	2.3		21	22.2		23	23.9		24	19.4		29	3.9		29	8.3	N.
	29	9.5		30	15.7		30	5.1		32	6.8		33	12.3							

	d	h		d	h
Period of Ariel,	2	12.489	Period of Titania,	8	16.942
Period of Umbriel,	4	3.460	Period of Oberon,	13	11.119

NOTE.—For Ariel only every third elongation is given, and for Umbriel every alternate one. The intermediate ones may be found by adding multiples of the period of the satellite.



Date.	Position Angle.	Apparent Distance.
Jan.	231°.0	16″.8
Sept.	233.0	16.5
Nov.	232.5	17.0

APPARENT ORBIT OF THE SATELLITE OF NEPTUNE IN 1886, *AS SEEN IN AN INVERTING TELESCOPE.*

WASHINGTON MEAN TIMES OF ELONGATIONS.

South West.		North East.		South West.		North East.		South West.		North East.	
	d h		d h		d h		d h		d h		d h
		Jan.	0 11.0	Aug.	26 10.5	Aug.	29 9.1	Oct.	30 1.9	Nov.	2 0.5
Jan.	3 9.4		6 8.0	Sept.	1 7.5	Sept.	4 6.1	Nov.	4 22.9		7 21.6
	9 6.4		12 5.0		7 4.5		10 3.1		10 20.0		13 18.6
	15 3.5		18 2.1		13 1.6		16 0.2		16 17.0		19 15.6
	21 0.5		23 23.1		18 22.6		21 21.2		22 14.1		25 12.7
	26 21.6		29 20.2		24 19.7		27 18.3		28 11.1	Dec.	1 9.7
Feb.	1 18.7	Feb.	4 17.2		30 16.7	Oct.	3 15.3	Dec.	4 8.1		7 6.8
	7 15.7		10 14.3	Oct.	6 13.8		9 12.4		10 5.2		13 3.8
	13 12.8		16 11.3		12 10.8		15 9.4		16 2.2		19 0.9
	19 9.8		22 8.4		18 7.9		21 6.5		21 23.3		24 21.9
	25 6.9		28 5.5		24 4.9		27 3.5		27 20.3		30 19.0

The above times are those of each passage of the satellite through an apsis of its apparent orbit. The position of the satellite at any other time may be found by measuring around the orbit from the apsis last passed through, remembering that the radius vector of the satellite describes equal areas in equal times.

Period of the satellite of Neptune, $5^{d}\ 21^{h}.045$.

In the above diagrams, the central circle represents the planet, and is on the same scale as the orbits.

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

	d	h	m		°	′
Jan.	2	13	46	☌ ☿ ☽ .... ☿ —	2	34
	2	14	–	♂ greatest Hel. Lat. N.		
	3	4	–	♀ in ☊		
	7	19	–	☿ greatest elong. W.	23	26
	8	13	5	☌ ♀ ☽ .... ♀ —	0	38
	9	17	–	☌ ♄ μ Geminorum ♄	0	0
	12	19	–	⛢ Stationary.		
	13	–	–	♀ greatest brilliancy.		
	14	23	36	☌ ♆ ☽ .... ♆ +	2	58
	17	19	59	☌ ♄ ☽ .... ♄ +	4	8
	19	9	–	☿ in ☋		
	19	15	–	♃ Stationary.		
	23	8	43	☌ ♂ ☽ .... ♂ +	2	56
	23	20	–	⛢ ♃ .... ⛢ S.E.	1	51
	24	0	48	☌ ♃ ☽ .... ♃ —	0	17
	24	3	5	☌ ⛢ ☽ .... ⛢ —	1	9
	25	8	–	♂ Stationary.		
	27	19	–	♀ Stationary.		
	28	19	–	♆ Stationary.		
	29	18	–	☿ in Aphelion.		
Feb.	2	3	7	☌ ☿ ☽ .... ☿ —	5	24
	5	1	28	☌ ♀ ☽ .... ♀ +	6	0
	5	17	–	♀ in Perihelion.		
	6	6	–	♂ in Aphelion.		
	10	16	–	□ ♆ ☉		
	11	7	12	☌ ♆ ☽ .... ♆ +	3	10
	14	3	51	☌ ♄ ☽ .... ♄ +	4	21
	18	2	–	☌ ♀ ☉ Inferior.		
	18	11	–	☌ ☿ ♀ .... ☿ —	11	23
	18	22	–	☿ greatest Hel. Lat. S.		
	19	13	12	☌ ♂ ☽ .... ♂ +	3	50
	20	8	29	☌ ♃ ☽ .... ♃ —	0	8
	20	12	2	☌ ⛢ ☽ .... ⛢ —	1	11
	23	22	–	☌ ☿ ☉ Superior.		
	27	16	–	♀ greatest Hel. Lat. N.		
Mar.	2	13	–	♄ Stationary.		
	3	4	57	☌ ♀ ☽ .... ♀ +	6	11
	5	–	–	☉ eclipsed, vis. at Wash.		
	5	19	–	☍ ♂ ☉		
	6	0	44	☌ ☿ ☽ .... ☿ +	0	8
	9	20	–	♀ Stationary.		
	9	23	–	☿ in ☊		
	10	13	41	☌ ♆ ☽ .... ♆ +	3	15
	13	11	10	☌ ♄ ☽ .... ♄ +	4	27
	14	13	–	☿ in Perihelion.		
	18	8	23	☌ ♂ ☽ .... ♂ +	4	27
	19	14	31	☌ ♃ ☽ .... ♃ +	0	13
	19	21	19	☌ ⛢ ☽ .... ⛢ —	1	15
	19	23	–	☉ enters ♈, Spring com.		
	21	1	–	☍ ♃ ☉		
	21	10	–	☿ greatest elong. E.	18	40
	21	20	–	□ ♄ ☉		

	d	h	m		°	′
Mar.	24	21	–	☿ greatest Hel. Lat. N.		
	25	17	–	☍ ⛢ ☉		
	26	–	–	♀ greatest brilliancy.		
	29	13	–	☿ Stationary.		
	31	2	30	☌ ♀ ☽ .... ♀ +	1	52
Apr.	4	6	51	☌ ☿ ☽ .... ☿ +	6	25
	6	20	37	☌ ♆ ☽ .... ♆ +	3	13
	8	11	–	☌ ☿ ☉ Inferior.		
	9	18	56	☌ ♄ ☽ .... ♄ +	4	24
	14	7	57	☌ ♂ ☽ .... ♂ +	3	44
	15	18	47	☌ ♃ ☽ .... ♃ +	0	29
	16	5	–	♂ Stationary.		
	16	5	8	☌ ⛢ ☽ .... ⛢ —	0	59
	18	4	–	☿ in ☋		
	22	11	–	☿ Stationary.		
	24	17	–	♀ in ☋		
	27	13	–	☿ in Aphelion.		
	29	12	7	☌ ♀ ☽ .... ♀ +	0	19
	29	14	–	♀ greatest elong. W.	46	9
May	1	7	36	☌ ☿ ☽ .... ☿ —	0	6
	4	5	20	☌ ♆ ☽ .... ♆ +	3	11
	6	21	–	☿ greatest elong. W.	26	26
	7	4	43	☌ ♄ ☽ .... ♄ +	4	13
	11	19	12	☌ ♂ ☽ .... ♂ +	2	6
	12	22	38	☌ ♃ ☽ .... ♃ +	0	25
	13	10	54	☌ ⛢ ☽ .... ⛢ —	1	3
	15	13	–	☌ ♆ ☉		
	17	21	–	☿ greatest Hel. Lat. S.		
	23	8	–	♃ Stationary.		
	28	20	–	♀ in Aphelion.		
	29	8	9	☌ ♀ ☽ .... ♀ +	1	18
	30	13	–	☌ ♆ ☿ .... ♆ —	0	32
	31	15	49	☌ ♆ ☽ .... ♆ +	3	13
	31	20	17	☌ ☿ ☽ .... ☿ +	4	3
June	3	16	33	☌ ♄ ☽ .... ♄ +	4	0
	5	22	–	☿ in ☊		
	8	16	8	☌ ♂ ☽ .... ♂ +	0	6
	9	4	22	☌ ♃ ☽ .... ♃ +	0	1
	9	15	43	☌ ⛢ ☽ .... ⛢ —	1	17
	9	19	–	⛢ Stationary.		
	10	12	–	□ ♂ ☉		
	10	12	–	☿ in Perihelion.		
	11	10	–	☌ ☿ ☉ Superior.		
	17	17	–	□ ♃ ☉		
	20	8	–	☌ ☿ ♄ .... ☿ +	2	17
	20	16	–	♀ greatest Hel. Lat. S.		
	20	20	–	☉ enters ♋, Summer com.		
	20	21	–	☿ greatest Hel. Lat. N.		
	22	7	–	☌ ♂ β Virginis . ♂ —	0	13
	24	16	–	□ ⛢ ☉		
	26	14	–	☌ ♆ ♀ .... ♆ +	0	29
	27	17	–	☌ ♂ ♃ .... ♂ —	0	59

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

	d	h	m				°	′
June	28	3	3	☌ ♆ ☽	....	♆ +	3	21
	28	6	27	☌ ♀ ☽	....	♀ +	2	57
July	1	8	29	☌ ♄ ☽	....	♄ +	3	51
	2	0	-	☉	in Apogee.			
	2	19	54	☌ ☿ ☽	....	☿ +	4	35
	3	9	-	☌ ♄ ☉				
	6	13	56	☌ ♃ ☽	....	♃ −	0	33
	6	20	3	☌ ♂ ☽	....	♂ −	2	1
	6	21	45	☌ ♅ ☽	....	♅ −	1	34
	7	3	-	♃	greatest Hel. Lat. N.			
	8	21	-	☌ ♅ ♂	....	♅ +	0	34
	14	7	-	☿	in ☋			
	18	19	-	☿	greatest elong. E.		26	54
	19	3	-	♂	in ☋			
	24	12	-	☿	in Aphelion.			
	25	13	29	☌ ♆ ☽	....	♆ +	3	31
	28	5	-	☌ ♀	μ Geminorum	♀ −	0	5
	28	5	24	☌ ♀ ☽	....	♀ +	3	46
	29	0	47	☌ ♄ ☽	....	♄ +	3	45
	31	22	56	☌ ☿ ☽	....	☿ −	3	5
Aug.	2	0	-	☿	Stationary.			
	3	3	57	☌ ♃ ☽	....	♃ −	1	8
	3	6	39	☌ ♅ ☽	....	♅ −	1	50
	4	5	40	☌ ♂ ☽	....	♂ −	3	57
	7	22	-	☌ ♀ ♄	....	♀ −	0	1
	13	20	-	☿	greatest Hel. Lat. S.			
	15	15	-	☌ ☿ ☉	Inferior.			
	15	21	-	♀	in ☊			
	16	0	-	☌ ♅ ♃	....	♅ −	0	32
	20	6	-	□ ♆ ☉				
	21	21	51	☌ ♆ ☽	....	♆ +	3	35
	23	3	-	♃	in Aphelion.			
	25	11	-	☿	Stationary.			
	25	16	23	☌ ♄ ☽	....	♄ +	3	39
	27	3	21	☌ ♀ ☽	....	♀ +	3	10
	27	16	9	☌ ☿ ☽	....	☿ +	0	14
	28	19	-	♆	Stationary.			
	28	-	-	☉	eclipsed, vis. at Wash.			
	30	18	32	☌ ♅ ☽	....	♅ −	2	0
	30	21	45	☌ ♃ ☽	....	♃ −	1	41
Sept.	1	16	-	☿	greatest elong. W.		18	5
	1	20	-	☿	in ☊			
	1	20	34	☌ ♂ ☽	....	♂ −	5	26
	6	11	-	☿	in Perihelion.			
	11	2	-	☌ ♀	α Leonis . .	♀ +	0	38
	16	20	-	☿	greatest Hel. Lat. N.			
	18	3	50	☌ ♆ ☽	....	♆ +	3	31
	18	4	-	♀	in Perihelion.			
	22	5	19	☌ ♄ ☽	....	♄ +	3	29
	22	10	-	☉	enters ♎, Autumn com.			
	25	23	25	☌ ♀ ☽	....	♀ +	0	34
	27	3	0	☌ ☿ ☽	....	☿ −	1	6
Sept.	27	8	0	☌ ♅ ☽	....	♅ −	2	8
	27	11	-	☌ ☿ ☉	Superior.			
	27	17	39	☌ ♃ ☽	....	♃ −	2	9
	29	1	-	☌ ♅ ☿	....	♅ −	0	34
	30	16	-	☌ ♅ ☉				
	30	16	32	☌ ♂ ☽	....	♂ −	6	11
Oct.	3	9	-	☌ ☿ ♃	....	☿ −	0	22
	9	0	-	☌ ♃ ☉				
	10	7	-	☿	in ☋			
	10	8	-	♀	greatest Hel. Lat. N.			
	13	18	-	☌ ♅ ♀	....	♅ −	0	52
	14	22	-	□ ♄ ☉				
	15	8	36	☌ ♆ ☽	....	♆ +	3	24
	19	14	7	☌ ♄ ☽	....	♄ +	3	16
	20	11	-	☿	in Aphelion.			
	22	4	-	☌ ♀ ♃	....	♀ +	0	18
	24	20	57	☌ ♅ ☽	....	♅ −	2	18
	25	13	39	☌ ♃ ☽	....	♃ −	2	35
	25	19	50	☌ ♀ ☽	....	♀ −	2	36
	27	19	41	☌ ☿ ☽	....	☿ −	7	4
	29	17	1	☌ ♂ ☽	....	♂ −	6	6
Nov.	3	13	-	♄	Stationary.			
	9	20	-	☿	greatest Hel. Lat. S.			
	11	13	58	☌ ♆ ☽	....	♆ +	3	17
	13	7	-	☿	greatest elong. E.		22	38
	15	19	30	☌ ♄ ☽	....	♄ +	3	3
	18	2	-	☍ ♆ ☉				
	21	7	16	☌ ♅ ☽	....	♅ −	2	33
	22	7	37	☌ ♃ ☽	....	♃ −	3	1
	22	15	-	☿	Stationary.			
	24	20	53	☌ ♀ ☽	....	♀ −	4	41
	26	3	56	☌ ☿ ☽	....	☿ −	5	40
	27	20	40	☌ ♂ ☽	....	♂ −	5	8
	28	21	-	☿	in ☊			
Dec.	2	11	-	☌ ♀ ☉	Superior.			
	2	19	-	☌ ☿ ☉	Inferior.			
	2	20	-	☌ ☿ ♀	....	☿ +	1	14
	3	11	-	☿	in Perihelion.			
	5	10	-	♀	in ☋			
	8	21	5	☌ ♆ ☽	....	♆ +	3	20
	12	13	-	☿	Stationary.			
	12	23	50	☌ ♄ ☽	....	♄ +	2	59
	13	19	-	☿	greatest Hel. Lat. N.			
	18	14	37	☌ ♅ ☽	....	♅ −	2	52
	19	22	21	☌ ♃ ☽	....	♃ −	3	24
	21	4	-	☉	enters ♑, Winter com.			
	22	14	-	☿	greatest elong. W.		22	6
	22	20	45	☌ ☿ ☽	....	☿ −	3	5
	22	22	-	♂	greatest Hel. Lat. S.			
	25	4	30	☌ ♀ ☽	....	♀ −	4	39
	27	1	36	☌ ♂ ☽	......	♂ −	3	29

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Åbo	+ 60 26 56.8	− 9 53.5	9.998902	− 6 37 20.3	− 1 29 8.2
Adelaide	− 34 57	+ 10 47.8	9.999526	− 14 22 33.1	− 9 14 21.0
Albany	+ 42 39 49.5	− 11 28.2	9.999336	− 0 13 12.87	+ 4 54 59.22
Alfred	+ 42 15 19.8	− 11 27.2	9.999346	+ 0 2 55.00	+ 5 11 7.09
Algier	+ 36 45 2.7	− 11 1.6	9.999483	− 5 20 23.48	− 0 12 11.39
Allegheny	+ 40 27 41.6	− 11 21.6	9.999391	+ 0 11 50.84	+ 5 20 2.93
Altona	+ 53 32 45.3	− 11 0.8	9.999063	− 5 47 58.44	− 0 39 46.35
Amherst	+ 42 22 15.6	− 11 27.5	9.999343	− 0 18 4.8	+ 4 50 7.3
Annapolis	+ 38 58 53.5	− 11 15.0	9.999428	− 0 2 15.60	+ 5 5 56.49
Ann Arbor	+ 42 16 48.0	− 11 27.3	9.999346	+ 0 26 43.10	+ 5 34 55.19
Armagh	+ 54 21 12.7	− 10 54.9	9.999043	− 4 41 36.6	+ 0 26 35.5
Athens	+ 37 58 20.0	− 11 9.4	9.999453	− 6 43 7.8	− 1 34 55.7
Berlin	+ 52 30 16.7	− 11 7.7	9.999088	− 6 1 47.00	− 0 53 34.91
Berne	+ 46 57 8.7	− 11 29.2	9.999227	− 5 37 58.1	− 0 29 46.0
Bethlehem	+ 40 36 23.9	− 11 22.2	9.999388	− 0 6 40.19	+ 5 1 31.90
Birr Castle	+ 53 5 47.0	− 11 3.9	9.999074	− 4 36 31.2	+ 0 31 40.9
Bologna	+ 44 29 47.0	− 11 30.5	9.999289	− 5 53 36.7	− 0 45 24.6
Bonn	+ 50 43 45.0	− 11 17.3	9.999132	− 5 36 35.38	− 0 28 23.29
Bothkamp	+ 54 12 9.6	− 10 56.0	9.999047	− 5 48 42.9	− 0 40 30.8
Breslau	+ 51 6 56.5	− 11 15.4	9.999122	− 6 16 20.80	− 1 8 8.71
Brussels	+ 50 51 10.5	− 11 16.8	9.999129	− 5 25 40.7	− 0 17 28.6
Cambridge (*England*)	+ 52 12 51.6	− 11 9.4	9.999095	− 5 8 34.84	− 0 0 22.75
Cambridge (*Mass.*)	+ 42 22 48.3	− 11 27.6	9.999343	− 0 23 41.11	+ 4 44 30.98
Cape of Good Hope	− 33 56 3.4	+ 10 39.0	9.999550	− 6 22 7.1	− 1 13 55.0
Chapultepec	+ 19 25 17.5	− 7 12.0	9.999841	+ 1 28 26.15	+ 6 36 38.24
Charkow	+ 50 0 10.2	− 11 20.5	9.999150	− 7 33 6.8	− 2 24 54.7
Chicago	+ 41 50 1.0	− 11 26.2	9.999357	+ 0 42 14.69	+ 5 50 26.78
Christiania	+ 59 54 43.7	− 10 0.2	9.998914	− 5 51 5.94	− 0 42 53.85
Cincinnati (*New Obs.*)	+ 39 8 35.5	− 11 15.8	9.999424	+ 0 29 29.33	+ 5 37 41.42
Cincinnati (*Old Obs.*)	+ 39 6 26.5	− 11 15.6	9.999425	+ 0 29 46.85	+ 5 37 58.94
Clinton	+ 43 3 17.0	− 11 28.9	9.999326	− 0 6 34.65	+ 5 1 37.44
Coimbra	+ 40 12 25.8	− 11 20.6	9.999398	− 4 34 37.6	+ 0 33 34.5
Copenhagen	+ 55 41 13.6	− 10 43.9	9.999011	− 5 58 31.3	− 0 50 19.2
Cordoba	− 31 25 15.4	+ 10 13.5	9.999608	− 0 51 27.0	+ 4 16 45.1
Cracow	+ 50 3 50.0	− 11 20.3	9.999149	− 6 28 2.6	− 1 19 50.5
Dantzig	+ 54 21 18.0	− 10 54.9	9.999043	− 6 22 51.4	− 1 14 39.3
Dorpat	+ 58 22 47.4	− 10 17.6	9.998948	− 6 55 5.6	− 1 46 53.5
Dublin	+ 53 23 13	− 11 1.9	9.999066	− 4 42 50	+ 0 25 22
Düsseldorf	+ 51 12 25	− 11 15.0	9.999120	− 5 35 17	− 0 27 5
Dun Echt	+ 57 9 36	− 10 30.2	9.998977	− 4 58 32.1	+ 0 9 40.0
Durham	+ 54 46 6.2	− 10 51.6	9.999033	− 5 1 52.3	+ 0 6 19.8
Edinburgh	+ 55 57 23.2	− 10 41.5	9.999005	− 4 55 29.04	+ 0 12 43.05
Florence	+ 43 46 4.1	− 11 29.9	9.990308	− 5 53 13.6	− 0 45 1.5
Geneva	+ 46 11 58.8	− 11 30.1	9.999246	− 5 32 48.86	− 0 24 36.77
Georgetown	+ 38 54 26.2	− 11 14.6	9.999430	+ 0 0 6.20	+ 5 8 18.29
Glasgow (*Missouri*)	+ 39 16 16.8	− 11 16.4	9.999421	+ 1 3 5.93	+ 6 11 18.02
Glasgow (*Scotland*)	+ 55 52 42.8	− 10 42.2	9.999006	− 4 51 1.5	+ 0 17 10.6

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude From Washington.	Longitude From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Göttingen	+ 51 31 47.9	— 11 13.3	9.999112	— 5 47 58.33	— 0 39 46.24
Gotha	+ 50 56 37.5	— 11 16.3	9.999127	— 5 51 2.62	— 0 42 50.53
Greenwich	+ 51 28 38.4	— 11 13.6	9.999113	— 5 8 12.09	0 0 0
Hamburg	+ 53 33 7.0	— 11 0.8	9.999062	— 5 48 5.8	— 0 39 53.7
Hanover	+ 43 42 15	— 11 29.8	9.999309	— 0 19 4.13	+ 4 49 7.96
Hastings-on-Hudson	+ 40 59 25	— 11 23.6	9.999378	— 0 12 42.4	+ 4 55 29.7
Haverford	+ 40 0 36.5	— 11 19.8	9.999402	— 0 6 59.34	+ 5 1 12.75
Helsingfors	+ 60 9 43.3	— 9 57.1	9.998909	— 6 48 1.25	— 1 39 49.16
Hudson	+ 41 14 42.6	— 11 24.4	9.999371	+ 0 17 32.06	+ 5 25 44.15
Kasan	+ 55 47 24.2	— 10 43.0	9.999009	— 8 24 41.0	— 3 16 28.9
Kew	+ 51 28 6	— 11 13.6	9.999114	— 5 6 57.0	+ 0 1 15.1
Kiel	+ 54 20 29.7	— 10 55.0	9.999043	— 5 48 47.85	— 0 40 35.76
Kiew	+ 50 27 11.1	— 11 18.6	9.999139	— 7 10 12.73	— 2 2 0.64
Königsberg	+ 54 42 50.6	— 10 52.0	9.999034	— 6 30 11.00	— 1 21 58.91
Kremsmünster	+ 48 3 23.7	— 11 27.0	9.999199	— 6 4 44.3	— 0 56 32.2
Leiden	+ 52 9 20.0	— 11 9.8	9.999097	— 5 26 8.44	— 0 17 56.35
Leipzig	+ 51 20 6.3	— 11 14.3	9.999117	— 5 57 46.11	— 0 49 34.02
Leyton	+ 51 34 34	— 11 13.0	9.999111	— 5 8 11.22	+ 0 0 0.87
Lisbon (*Marine Obs.*)	+ 38 42 17.6	— 11 13.5	9.999435	— 4 31 38.49	+ 0 36 33.60
Lisbon (*Royal Obs.*)	+ 38 42 31.3	— 11 13.6	9.999435	— 4 31 27.41	+ 0 36 44.68
Liverpool	+ 53 24 4	— 11 1.8	9.999066	— 4 55 54.9	+ 0 12 17.2
Lübec	+ 53 51 31.2	— 10 58.6	9.999055	— 5 50 57.64	— 0 42 45.55
Lund	+ 55 41 52.1	— 10 43.8	9.999011	— 6 0 57.11	— 0 52 45.02
Madison	+ 43 4 36.7	— 11 28.9	9.999325	+ 0 49 25.80	+ 5 57 37.9
Madras	+ 13 4 8.1	— 5 3.3	9.999926	—10 29 11.5	— 5 20 59.4
Madrid	+ 40 24 30.0	— 11 21.4	9.999393	— 4 53 26.7	+ 0 14 45.4
Manheim	+ 49 29 11.0	— 11 22.5	9.999163	— 5 42 2.61	— 0 33 50.52
Marburg	+ 50 48 46.9	— 11 16.9	9.999130	— 5 43 17.1	— 0 35 5.0
Markree	+ 54 10 31.8	— 10 56.2	9.999047	— 4 34 23.7	+ 0 33 48.4
Marseilles	+ 43 18 19.1	— 11 29.3	9.999320	— 5 29 46.73	— 0 21 34.64
Melbourne	— 37 49 53.3	+ 11 8.6	9.999456	—14 48 6.9	— 9 39 54.8
Mexico	+ 19 26 1.3	— 7 12.2	9.999840	+ 1 28 14.58	+ 6 36 26.67
Milan	+ 45 27 59.2	— 11 30.6	9.999265	— 5 44 58.06	— 0 36 45.97
Modena	+ 44 38 52.8	— 11 30.6	9.999285	— 5 51 54.9	— 0 43 42.8
Montsouris	+ 48 49 18.0	— 11 24.8	9.999180	— 5 17 32.77	— 0 9 20.68
Moscow	+ 55 45 19.8	— 10 43.3	9.999009	— 7 38 29.0	— 2 30 16.9
Mount Hamilton	+ 37 21 3	— 11 5.6	9.999468	+ 2 58 14.6	+ 8 6 26.7
Munich	+ 48 8 45.5	— 11 26.7	9.999197	— 5 54 38.22	— 0 46 26.13
Naples	+ 40 51 45.4	— 11 23.1	9.999381	— 6 5 13.0	— 0 57 0.9
Neuchatel	+ 46 59 51.0	— 11 29.1	9.999226	— 5 36 2.3	— 0 27 50.2
New Haven	+ 41 18 36.5	— 11 24.6	9.999370	— 0 16 29.90	+ 4 51 42.19
New York (*Columb. Coll.*)	+ 40 45 23.1	— 11 22.7	9.999384	— 0 12 18.40	+ 4 55 53.69
New York (RUTHERFURD)	+ 40 43 48.5	— 11 22.6	9.999384	— 0 12 15.47	+ 4 55 56.62
Nicolaeff	+ 46 58 20.6	— 11 29.2	9.999226	— 7 16 6.2	— 2 7 54.1
Odessa	+ 46 28 36	— 11 29.8	9.999239	— 7 11 14.4	— 2 3 2.3
Ogden	+ 41 13 8.6	— 11 24.3	9.999372	+ 2 19 47.52	+ 7 27 59.61
Ó-Gyalla	+ 47 52 43.4	— 11 27.4	9.999204	— 6 20 57.68	— 1 12 45.59

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Olmütz . . .	+ 49 35 43	– 11 22.1	9.999160	– 6 17 14.7	– 1 9 2.6
Oxford (*Radcliffe*) .	+ 51 45 36.0	– 11 12.0	9.999106	– 5 3 9.5	+ 0 5 2.6
Oxford (*University*) .	+ 51 45 34.2	– 11 12.0	9.999106	– 5 3 11.69	+ 0 5 0.40
Padua . . .	+ 45 24 2.5	– 11 30.6	9.999266	– 5 55 41.22	– 0 47 29.13
Palermo . . .	+ 38 6 44	– 11 10.2	9.999449	– 6 1 37.1	– 0 53 25.0
Paramatta . .	– 33 48 49.8	+ 10 37.8	9.999553	–15 12 18.3	–10 4 6.2
Paris . . .	+ 48 50 11.8	– 11 24.8	9.999179	– 5 17 33.11	– 0 9 21.02
Philadelphia . .	+ 39 57 7.5	– 11 19.5	9.999404	– 0 7 33.64	+ 5 0 38.45
Pola . . .	+ 44 51 49.0	– 11 30.6	9.999280	– 6 3 35.27	– 0 55 23.18
Potsdam . . .	+ 52 22 56	– 11 8.4	9.999091	– 6 0 29	– 0 52 17
Poughkeepsie . .	+ 41 41 18	– 11 25.8	9.999360	– 0 12 38.5	+ 4 55 33.6
Prague . . .	+ 50 5 18.8	– 11 20.2	9.999148	– 6 5 53.5	– 0 57 41.4
Princeton . . .	+ 40 20 57.8	– 11 21.2	9.999394	– 0 9 34.54	+ 4 58 37.55
Pulkowa . . .	+ 59 46 18.7	– 10 1.8	9.998917	– 7 9 30.76	– 2 1 18.67
Quebec . . .	+ 46 48 17.3	– 11 29.4	9.999231	– 0 23 22.8	+ 4 44 49.3
Rio de Janeiro . .	– 22 54 23.8	+ 8 14.0	9.999782	– 2 15 30.68	+ 2 52 41.41
Rochester . .	+ 43 8 15	– 11 29.0	9.999324	+ 0 3 8	+ 5 11 20
Rome . . .	+ 41 53 53.7	– 11 26.3	9.999355	– 5 58 6.79	– 0 49 54.70
Saint Petersburg .	+ 59 56 29.7	– 9 59.8	9.998913	– 7 9 25.6	– 2 1 13.5
San Fernando . .	+ 36 27 41.5	– 10 59.5	9.999490	– 4 43 22.5	+ 0 24 49.6
Santiago de Chile .	– 33 26 42.0	+ 10 34.4	9.999561	– 0 25 29.7	+ 4 42 42.4
Schwerin . . .	+ 53 37 38.2	– 11 0.2	9.999061	– 5 53 52.8	– 0 45 40.7
Senftenberg . .	+ 50 5 10.1	– 11 20.2	9.999148	– 6 14 2.7	– 1 5 50.6
Speier . . .	+ 49 18 55.4	– 11 23.2	9.999167	– 5 41 57.7	– 0 33 45.6
Stockholm . .	+ 59 20 33.0	– 10 6.9	9.998927	– 6 20 26.09	– 1 12 14.00
Stonyhurst . .	+ 53 50 40	– 10 58.7	9.999055	– 4 58 19.41	+ 0 9 52.68
Strassburg (*New Obs.*)	+ 48 34 59.7	– 11 25.5	9.999186	– 5 39 16.74	– 0 31 4.65
Strassburg (*Old Obs.*)	+ 48 34 53.8	– 11 25.5	9.999186	– 5 39 14.58	– 0 31 2.49
Sydney . . .	– 33 51 41.1	+ 10 38.3	9.999552	–15 13 2.7	–10 4 50.6
Toulouse . . .	+ 43 36 47	– 11 29.7	9.999312	– 5 14 3.2	– 0 5 51.1
Turin . . .	+ 45 4 6.0	– 11 30.7	9.999275	– 5 39 0.5	– 0 30 48.4
Twickenham . .	+ 51 27 4.2	– 11 13.7	9.999114	– 5 6 59.0	+ 0 1 13.1
Upsala . . .	+ 59 51 31.5	– 10 0.8	9.998915	– 6 18 42.7	– 1 10 30.6
Utrecht . . .	+ 52 5 10.5	– 11 10.2	9.999098	– 5 28 43.8	– 0 20 31.7
Venice . . .	+ 45 25 49.5	– 11 30.6	9.999266	– 5 57 37.5	– 0 49 25.4
Vienna (*Josephstadt*)	+ 48 12 53.8	– 11 26.6	9.999195	– 6 13 37.4	– 1 5 25.3
Vienna (*New Obs.*) .	+ 48 13 55.4	– 11 26.5	9.999195	– 6 13 33.31	– 1 5 21.22
Vienna (*Old Obs.*) .	+ 48 12 35.5	– 11 26.6	9.999195	– 6 13 43.83	– 1 5 31.74
Warsaw . . .	+ 52 13 5.7	– 11 9.4	9.999095	– 6 32 19.5	– 1 24 7.4
Washington . .	+ 38 53 38.8	– 11 14.5	9.999430	0 0 0	+ 5 8 12.09
West Point . .	+ 41 23 31	– 11 24.9	9.999368	– 0 12 22.71	+ 4 55 49.38
Wilhelmshaven .	+ 53 31 52.0	– 11 0.9	9.999063	– 5 40 47.30	– 0 32 35.21
Williamstown (*Mass.*)	+ 42 42 49	– 11 28.3	9.999334	– 0 15 18.6	+ 4 52 53.5
Williamstown (*Victoria*)	– 37 52 7.2	+ 11 8.8	9.999455	–14 47 50.9	– 9 39 38.8
Wilna . . .	+ 54 41 0	– 10 52.3	9.999035	– 6 49 24.0	– 1 41 11.9
Windsor . . .	– 33 36 28.9	+ 10 35.9	9.999558	–15 11 33.8	–10 3 21.7
Zürich . . .	+ 47 22 40.0	– 11 28.5	9.999216	– 5 42 24.7	– 0 34 12.6

ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

PART I—THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

THE greater portion of this Ephemeris, embracing the positions of the sun and moon; the distances of the moon from the centres of the sun and the four most conspicuous planets, and from certain fixed stars; the ephemerides of the planets Mercury, Venus, Mars, Jupiter, and Saturn, is designed for the special use of navigators. The remainder contains the ephemeris of Uranus and Neptune, the heliocentric co-ordinates of the seven major planets, the rectangular equatorial co-ordinates of the sun, the moon's longitude and latitude, data for the libration of the moon, the obliquity of the ecliptic, the equation of equinoxes, etc.

TIME.

Astronomers make use of several different kinds of time: mean solar time; true, or apparent solar time; and sidereal time.

Solar Time.—Solar time is that used for all the purposes of ordinary life, and is measured by the daily motion of the sun. A *Solar Day* is the interval of time between two successive transits of the sun over the same meridian; and the hour-angle of the sun is called *Solar Time.* This is the most natural and direct measure of time. But the intervals between the successive returns of the sun to the same meridian are not exactly equal, owing to the varying motion of the earth around the sun, and to the obliquity of the ecliptic. The intervals between the sun's transits over the meridian being unequal, it is impossible to regulate a clock or chronometer so that it shall accurately follow the sun.

To avoid the irregularity which would arise from using the true sun as the measure of time, a fictitious sun, called the *Mean Sun,* is supposed to move in the equator with a uniform velocity. This mean sun is supposed to keep, on the average, as near the real sun as is consistent with perfect uniformity of motion; it is sometimes in advance of it, and sometimes behind it, the greatest deviation being about 16 minutes of time.

Mean Solar Time, which is perfectly equable in its increase, is measured by the motion of this mean sun. The clocks in ordinary use and the chronometers used by navigators are regulated to mean solar time.

True, or *Apparent Solar Time* is measured by the motion of the real sun.

The difference between apparent and mean time is called the *Equation of Time.* By means of it we change apparent to mean time, or the reverse. Thus, if the apparent time be given, the mean time corresponding to it will be obtained by adding or subtracting the equation of time, according to the precept at the head of the column in which it is found, on page I of the Calendar for each month. If the mean time be given, the apparent time is obtained by applying the equation of time as directed by the precept on page II of the Calendar.

Sidereal Time.—Sidereal time is measured by the daily motion of the stars; or, as it is used by astronomers, by the daily motion of that point in the equator from which the true right ascensions of the stars are counted. This point is the vernal equinox, and its hour-angle is called *Sidereal Time.* Astronomical clocks, regulated to sidereal time, are called sidereal clocks.

A *Sidereal Day* is the interval of time between the transit of the vernal equinox over any meridian, and its next succeeding return to the same meridian. It is about 3^m 56^s shorter than the mean solar day; 365¼ solar days, or a year, being divided into 366¼ sidereal days. It is divided into 24 hours. The sidereal hours are counted from 0 to 24, commencing with the instant of the passage of the true vernal equinox over the upper meridian, and ending with its return to the same meridian. About March 21st of each year the sidereal clock agrees with the mean time, or ordinary clock; and the former gains on the latter about 3^m 56^s per day, so that at the end of a year it will have gained an entire day, and will again agree with the mean time clock.

Day.—The *Civil Day*, according to the customs of society, commences at midnight, and comprises twenty-four hours from one midnight to the next following. The hours are counted from 0 to 12 from midnight to noon, after which they are again reckoned from 0 to 12 from noon to midnight. Thus the day is divided into two periods of 12 hours each; of which the first is marked A. M., and the last is marked P. M.

The *Astronomical Day* commences at noon on the civil day of the same date. It also comprises twenty-four hours; but they are reckoned from 0 to 24, and from the noon of one day to that of the next following. The astronomical as well as the civil time may be either apparent or mean, according as it is reckoned from apparent noon or from mean noon.

The civil day begins twelve hours before the astronomical day; therefore the first period of the civil day answers to the last part of the preceding astronomical day, and the last period of the civil day corresponds to the first part of the same astronomical day. Thus, January 9th, 2 o'clock, A. M., civil time, is January 8th, 14^h, astronomical time; and January 9th, 2 o'clock, P. M., civil time, is also January 9th, 2^h, astronomical time. The rule, then, for the transformation of civil time into astronomical time is this:—*If the civil time is marked A. M., take one from the day and add twelve to the hours, and the result is the astronomical time wanted; if the civil time is marked P. M., take away the designation P. M., and the astronomical time is had without further change.*

To change astronomical to civil time, we simply write P. M. after it, if it is less than 12 *hours. If greater than* 12 *hours, we subtract* 12 *hours from it, add* 1 *to the days, and write A. M.* For example, January 3d, 23 hours, astronomical time, is January 4th, 11 o'clock, A. M., civil time.

If the longitude from Greenwich be expressed in time, and, when *west*, *added* to the local time, or, when *east*, *subtracted* from the local time, the result is the corresponding Greenwich time. If the local mean time is used, the result is the Greenwich mean time, which ordinarily is that required for the use of this Ephemeris. The rule is the same, whether we use mean or sidereal time.

THE CALENDAR.

The Calendar is divided into twelve months; and to each month are assigned eighteen pages, the contents of which are as follow:—

Page I contains, for Greenwich apparent noon of each day, *The Sun's Apparent Right Ascension*, and *Declination*, and the *Equation of Time.* Adjoining columns contain the differences of these quantities for one hour. By multiplying this difference by the hours and parts of an hour from Greenwich apparent noon, and adding the amount to, or subtracting it from, the quantity at noon, according as that quantity is increasing or decreasing, we obtain the value of any quantity for any given Greenwich apparent time. The hourly differences are given for the instant of apparent noon at Greenwich, and, when greater accuracy is required, should be first interpolated for half the hours and parts of an hour of the Greenwich apparent time.

This page is chiefly used when the sun is observed on the meridian, and the local apparent time is 0^h 0^m 0^s. The longitude from Greenwich expressed in time, if west, is at that instant the Greenwich apparent time, or time after Greenwich apparent noon; if east, it is time before

Greenwich apparent noon. The longitude of any place is therefore employed in reducing the quantities on this page to apparent noon at the place.

The right ascension of the sun thus reduced is the sidereal time of local apparent noon. The difference between it and the clock time of the meridian passage of the sun is the error of the clock on sidereal time.

The declinat'on of the sun reduced to the meridian, or apparent noon, of the place, is required in finding the latitude from a meridian altitude of the sun.

As an example of the use of page I:—

Let the sun's declination be required at apparent noon, 1886, May 30, at a place whose longitude is 180° 20′, or $12^h\ 1^m\ 20^s$ west from Greenwich.

		h	m	s
Local apparent time . . .	May 30,	0	0	0
Longitude from Greenwich (additive) . . .		12	1	20
Greenwich apparent time . . .	May 30,	12	1	20

Reducing the minutes and seconds to decimals of an hour, we find that this moment is $12^h.022$ after Greenwich apparent noon on May 30, or $11^h.978$ before Greenwich apparent noon on May 31.

On page 74 of the Ephemeris we find that the change of declination in one hour is

May 30, at Greenwich apparent noon . . .	22″.14
May 31, at Greenwich apparent noon . . .	21.19
Difference for one day	0.95

If we want to be very exact, we find the amount of this hourly difference for the time which is half way between Greenwich noon and the time of observation; that is, for 6 hours after Greenwich noon of the 30th, this being half of 12 hours. Six hours is 0.25 of a day; so the calculation is as follow:—

Difference for one hour, May 30	22″.14
Change for one day (or 0″.95) × 0.25 . . .	0.24
Difference at 6 hours after noon	21.90

$21''.90 \times 12.022 = 263''.3 = 4'\,23''.3$

Declination at Greenwich noon, May 30 . . .	N. 21° 48′ 6″.6
Change in 12.022 hours (additive) . . .	4 23.3
Sun's declination at time of observation . . .	N. 21 52 29.9

When the time of observation is only a few hours before Greenwich noon, it may be better to count the longitude backward from this nearest noon. Thus, in the example just given, the time is $11^h.978$ before Greenwich noon of May 31; half this interval is about 0.25 of a day, and the hourly motion for the middle of the interval is 21″.43. Then, we find:—

Declination at Greenwich noon, May 31 . .	N. 21° 56′ 46″.6
Product of 21″.43 × 11.978 = 256″.7 (subtractive) .	4 16.7
Sun's declination at time of observation . . .	N. 21 52 29.9

It will always be well to make the calculation by both methods, as their agreement will show both to be right.

At sea it is ordinarily sufficient to have the declination to the nearest half minute; and the reduction may be found by Table V of Bowditch's *American Practical Navigator.*

The equation of time, as has been before explained, is the number of minutes and seconds to be added to or subtracted from the apparent time, or the time given by an observation of the sun, to obtain the mean time. The heading of the column directs the manner in which the equation is to be applied. When there is a change in the course of the month from addition to subtraction or the reverse (as in the months of April and June), the two different directions are separated by a line, while a corresponding line below points out the dates between which the change takes place. The equation of time, as given on page I, is the mean time of apparent noon, or the hour-angle of the mean sun at that instant.

The Sun's Semidiameter, and the *Sidereal Time of Semidiameter Passing Meridian* are also given on page I. The sun's semidiameter is used in reducing the altitude of the upper or lower limb of the sun to the altitude of the centre; and in reducing the angular distance of the limb from the moon or some other object, to the distance from the centre of the sun. The sidereal time of semidiameter passing the meridian is employed in obtaining the passage of the sun's centre over the wires of a transit-instrument, when the passage of one limb only has been observed. The quantity found in this column is to be added to the time of transit of the first, or western, limb; and to be subtracted from the time of transit of the second, or eastern, limb.

Page II contains, for Greenwich mean noon of each day, *The Sun's Apparent Right Ascension*, and *Declination*, the *Equation of Time*, and the *Sidereal Time of Mean Noon*. The hourly changes of these quantities are also given, and may be used in reducing them to any Greenwich mean time. The hourly changes may be first interpolated for half the Greenwich time, when great precision is required, in the way described in explaining the calculation of the declination.

The right ascension and declination on pages I and II are affected by aberration, and therefore denote the apparent position of the true sun. Page II is more conveniently used when the mean time is known. This is the case in most observations of the sun out of the meridian, when the times have been noted by a clock or chronometer regulated to mean time. The quantities on this page can be reduced to mean noon of any place by interpolating for the longitude, as in the example of the sun's declination on the preceding page.

The sun's declination is required for finding the latitude of the place, the local time, and the sun's azimuth and amplitude, from observations of the sun.

The equation of time is needed in finding the mean time from observations of the sun, and the latitude from observations out of the meridian. The heading of the column directs the manner in which it is to be applied to mean time to obtain the apparent time.

The equation of time, as given on page II, is the apparent time of mean noon; and is equivalent to the hour-angle of the true sun at the instant of mean noon.

The sidereal time of mean noon is also the right ascension of the mean sun at Greeewich mean noon. It may be reduced for the longitude, or to any Greenwich mean time, by using the hourly difference, $9^s.8565$; or by Table III, appended to this volume, for reducing intervals of mean solar to sidereal time. Table LI of Bowditch's *Navigator* may be used for the same purpose when only the nearest quarter of a second is required.

The sun's right ascension and the sidereal time of mean noon, or right ascension of the mean sun, are useful in converting mean time to sidereal time. We first find the Greenwich mean time, then the R. A. of the mean sun for this time, as last explained: this being added to the local mean time will give the sidereal time.

The sidereal time of mean noon, reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time, gives the interval of sidereal time from noon. Subtracting from this the corresponding reduction of a sidereal interval to a mean time interval, in Table II, appended to this volume, or Table LII of Bowditch's *Navigator*, will give the mean time required. This reduction may also be found by multiplying $9^s.8296$ by the hours and parts of an hour of the given sidereal time.

As examples of the use of page II:—

1.—Let the sun's right ascension and the equation of time be required for 1886, May 15, $9^h\ 2^m\ 30^s$, A. M., mean time, at a place whose longitude is 100° 10′, or $6^h\ 40^m\ 40^s$, west of Greenwich.

		h	m	s
Local astronomical mean time . . .	May 14,	21	2	30
Longitude from Greenwich (additive)		6	40	40
Greenwich mean time	May 15,	3	43	10=$3^h.7194$

Sun's Right Ascension.

	h	m	s
May 15, Greenwich noon .	3	28	41.46
H. D. $9^s.873 \times 3.7194$ . .	+ 0		36.72
	3	29	18.18

Equation of Time.

	m	s
May 15, noon . .	3	51.37 (additive).
H. D. $-0^s.017 \times 3.72$.	—	0.06
	3	51.31

In this case, the hourly differences interpolated to half the interval, or $1^h.9$ after noon, have been used. The equation of time in this example is additive to mean time. Its reduction could also have been found by Table VI, A., of Bowditch's *Navigator*, but to seconds only.

2.—If the sidereal time is required for the same date and time, we have:—

	h	m	s
May 15, Sidereal Time (at Greenwich mean noon). . .	3	32	32.84
Hourly Difference $9^s.8565 \times 3.7194$	+	0	36.66
Add the local astronomical mean time	21	2	30.00
The required sidereal time is (rejecting 24^h) . . .	0	35	39.50

The reduction $0^m\ 36^s.66$ could have been found in Table III corresponding to the Greenwich mean time $3^h\ 43^m\ 10^s$. Also, by Table LI of Bowditch's *Navigator*, the reduction is $0^m\ 36^s.7$.

3.—On 1886, May 15, A. M., at a place whose longitude is 109° 10′ W., suppose the sidereal time to be $0^h\ 36^m\ 37^s.16$, and that the corresponding mean time is required.

The astronomical day is May 14; the longitude in time, $+6^h\ 40^m\ 40^s$, or $+6^h.678$.

	h	m	s	
May 14, Sidereal Time (at Greenwich mean noon)	3	28	36.28	
The H. D. $9^s.8565 \times 6.678$, or the reduction for $6^h\ 40^m\ 40^s$ in Table III .	+	1	5.82	
The sidereal time of local mean noon	3	29	42.10	
The given sidereal time ($+24^h$, if necessary for the following subtraction)	24	36	37.16	
Subtracting the first from the second gives the sidereal interval from noon .	21	6	55.06	$=21^h.11529$
$-9^s.8296 \times 21.11529$, or the reduction for $21^h\ 6^m\ 55^s.06$ in Table II . .	—	3	27.55	
The required astronomical mean time is . . May 14,	21	3	27.51	

Page III contains, for Greenwich mean noon of each day, *The Sun's True Longitude* and *Latitude*, and the *Logarithm of the Radius Vector of the Earth.* The longitudes of the sun are the true longitudes, not corrected for aberration. The longitude is given in two columns, headed λ and λ'; λ representing the sun's longitude counted from the true equinox of the date; and λ', the same co-ordinate counted from the mean equinox of the beginning of the year, (January $0^d.0$). A column of hourly differences enables the computer to obtain the sun's longitude for any hour from noon. The hourly differences of the logarithm of the radius vector are likewise given. The latitude is referred to the ecliptic of the date.

The last column on page III contains the *Mean Time of Sidereal Noon;* that is, the number of hours, minutes and seconds after Greenwich mean noon when the first point of Aries passes the meridian of Greenwich. It may be reduced to any meridian by interpolating for the longitude, or to any Greenwich sidereal time by means of the hourly difference, $-9^s.8296$. The reduction, however, can be taken directly from Table II for reducing intervals of sidereal time to mean solar time; or, approximately, from Table LII Bowditch's *Navigator*.

This column may be used in converting sidereal time to mean time instead of that on page II. As an illustration, let us take Example 3, above.

It is seen in advance that the sum of the mean time of sidereal noon and the given sidereal time is less than 24 hours. Were it more than 24 hours, the mean time of sidereal noon should be taken out for May 13, that is the preceding astronomical day.

	h	m	s	
May 14, the mean time of Greenwich sidereal noon is . .	20	28	1.98	
The H. D. $-9^s.8296 \times 6.678$, or the reduction for long., Table II	—	1	5.64	
The mean time of local sidereal noon	20	26	56.34	
Add the given sidereal time	0	36	37.16	$=0^h.6103$
The sum is	21	3	33.50	
$-9^s.8296 \times 0.6103$, or the reduction for $0^h\ 36^m\ 37^s.2$ in Table II .	—	0	6.00	
The required astronomical mean time . May 14,	21	3	27.50	

Page IV contains *The Moon's Semidiameter* and Equatorial *Horizontal Parallax*, for each mean noon and midnight at Greenwich. Columns adjoining those of the horizontal parallax give the change of this quantity in one hour, by means of which it can be reduced to any other Greenwich mean time, in the same way as the sun's declination and the equation of time in the preceding examples. The sign plus or minus prefixed to the hourly differences, shows whether the horizontal parallax is increasing or decreasing.

The reduction of the moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.272. It may also be obtained from Table XI of BOWDITCH's *Navigator*, or by simply computing the proportional part.

If, for example, the semidiameter of the moon is to be taken out for 1886, May 1, 10^h, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of May 1 is $4''.7$; then,

$$\text{as } 12^h : 10^h = 4''.7 : 3''.9,$$

which is the correction to be added to the semidiameter at noon, because the semidiameter is increasing. The moon's semidiameter then, for May 1, 10^h, is $15'\ 11''.1 + 0'\ 3''.9$, or $15'\ 15''.0$.

The moon's semidiameter and horizontal parallax are required for all observations of the moon. When great precision is needed, the hourly differences should be first interpolated for half the interval of Greenwich time from noon or midnight, and a correction applied to the horizontal parallax for the latitude of the place of observation.

The *Mean Time of the Moon's Upper Transit at Greenwich*, which is given on page IV to tenths of a minute, is also accompanied with a column of differences for one hour of longitude, by means of which, having the longitude turned into time, the local time of the moon's meridian passage at any other place may be computed. The reduction may be taken from BOWDITCH's Table XXVIII by simple inspection. The last column of this page contains the *Age* of the moon, or the time elapsed since the preceding new moon, to tenths of a day.

Pages V—XII contain *The Moon's Right Ascension*, and *Declination*, for each day and hour of Greenwich mean time. They are accompanied with columns of differences for one minute, which are also given at each hour. The Greenwich mean time, which is required for taking out these quantities, may be taken from a well-regulated chronometer, or obtained by applying the longitude, turned into time, to the local mean time of the observer. The right ascension, or declination, is taken out for the day and hour of the Greenwich mean time; the *Diff. for* 1 *Minute* multiplied by the minutes and parts of a minute of the Greenwich time; and the product added to, or subtracted from, the quantity, according as the quantity is increasing or decreasing.

Thus, suppose the moon's right ascension and declination are required for 1886, May 1, $10^h\ 10^m\ 30^s$, astronomical mean time at Greenwich: —

	Right Ascension.		*Declination.*
	h m s		° ′ ″
May 1, 10^h	0 57 26.59		N. 3 23 54.3
Diff. $2^s.0067 \times 10.500$ . .	+ 21.07	$9''.918 \times 10.500$	+ 1 44.1
May 1, $10^h\ 10^m\ 30^s$ . . .	0 57 47.66		N. 3 25 38.4

The differences interpolated for $5^m.2 = 0^h.09$ are for the right ascension $2^s.0069$, and for the declination $9''.917$, which may be used for greater precision.

Page XII contains also the *Phases of the Moon* and the dates of the *Moon's Perigee and Apogee*, or least and greatest distances from the earth.

Pages XIII—XVIII contain the *Lunar Distances*, or the angular distances of the centre of the moon from the centre of the sun, and from the four larger planets and certain fixed stars, as they would appear to an observer at the centre of the earth. They are given for every third hour of Greenwich mean time, beginning at noon; the dates are therefore astronomical. All the distances that can be observed on the same day are grouped together under that date; and the columns are read from left to right, across both pages of the same opening. The letter W. or E. is affixed to the name of the sun, planet or star, to indicate that it is on the west, or east, side of the moon.

An observer on the earth's surface having measured a lunar distance, corrected it for errors of his instrument and for the semidiameter of the objects, and cleared it from the effects of refraction and parallax, finds the true, or geocentric, distance; that is, the distance as it would have appeared from the centre of the earth at the moment of observation. With this distance and the distances in the Ephemeris of the same bodies on the same day, the Greenwich mean time of the observation can be found.

To lessen the labor of computation, there is given in the Ephemeris, between every two successive distances, the logarithm of the seconds of time in which the distance changes 1″; or, as it is usually called, the *Proportional Logarithm of the Difference.* It is given for the middle instant of the two hours between which it is placed.

For computing the Greenwich time we have the following rule:—

Find in the Almanac the two distances between which the true distance falls; take out the nearest of these, the hours of Greenwich time over it, and the P. L. of Diff. between them.

Find the difference between the true distance and the distance taken from the Almanac; and from the proportional logarithm of this difference, as found in the Navigator, subtract the P. L. of Diff. taken from the Almanac.

The result is the proportional logarithm of an interval of time to be added to the hours of Greenwich time, taken from the Almanac, when the earlier Almanac-distance is used; to be subtracted from the hours of Greenwich time, when the later Almanac-distance is used.

Another method is, to add the common logarithm of the difference of the true and the Almanac-distances to the P. L. of Diff. of the Almanac; the sum will be the common logarithm of the correction to be applied to the hours of Greenwich time. The Table of *Logarithms of small Arcs in Space or Time,* given at the end of the volume for 1871, saves the operation of reducing degrees (or hours) and minutes to seconds, and the reverse.

As the P. L. of Diff. in the Ephemeris varies, the Greenwich time found by the methods just described may not be sufficiently exact. To correct it for such variation, or second difference, take the difference between the P. L. of Diff. used and the one which follows it in the Ephemeris, (or, more strictly, half the difference of the preceding and following ones). With this difference, and the first correction of the Greenwich time already found, enter Table I, appended to this volume, and take out the corresponding seconds, which are to be added to the approximate Greenwich time when the Prop. Logs. in the Ephemeris are decreasing; and subtracted when they are increasing.

Thus the Greenwich mean time of the observation can be obtained. If the observer has noted the time of observation by a chronometer, the difference of this chronometer-time and the Greenwich mean time will be the error of the chronometer on Greenwich time as found from the lunar distance. In this way lunar distances can be used as a check upon the chronometer. By a series of carefully observed lunar distances on both sides of the moon, the chronometer-error may generally be ascertained within 20 or 30 seconds.

If the observer has found the local mean time of observation from the observed altitude of one of the bodies, or by a watch regulated to that time by recent observations and corrected for change of longitude in the interval, the difference of this local time and the Greenwich time found from the lunar distance will be his longitude. A longitude derived by this method should always be considered as uncertain by 5′ or more.

As an example of finding the Greenwich mean time from a lunar distance, suppose that in 1886, Feb. 10, about 6^{h} of Greenwich mean time, the corrected distance of the moon's centre from that of the sun is 74° 10′:—

	° ′ ″		
Corrected distance	74 10 0		
Distance in the Ephemeris, Feb. 10, VI^{h} . .	73 35 25	P. L.	0.3082
Difference	0 34 35	P. L.	0.7164
	h m s	P. L.	0.4082
Time from VI^{h} (*after*)	+1 10 19		
Corr. for 2d Diff., Table I	+ 4.5		
Greenwich mean time, Feb. 10 . . .	7 10 23.5		

By a table of common logarithms, or a table of logarithms of small arcs, the reduction of the Greenwich time would be found thus:—

From Ephemeris	P. L.	0.3082
Diff. of distances, $34' 35'' = 2075''$	log	3.3170
Red. of Greenwich time, $+1^h 10^m 19^s = 4219^s$	log	3.6252

The result is the same as by the previous method.

Pages 218—249 contain the geocentric ephemerides of the seven major planets. The positions are referred to the equator and true equinox of the date, and corrected for aberration; they are, therefore, apparent positions. All the data except meridian passage are given for the moment of Greenwich mean noon. The column *Meridian Passage* gives the hour, minute and tenth of that passage of the planet over the meridian of Greenwich which occurs next after the noon of the date.

The right ascension and declination of a planet are required whenever it has been observed for time, latitude or azimuth. The mode of reducing them to any instant of Greenwich mean time is the same as in the examples for the sun, previously given. The local mean time of passage across any other meridian can be found by dividing the daily differences by 24, and multiplying the quotient by the hours and fractions of the longitude of the place. The product is subtractive from the time of Greenwich passage when the place is east of Greenwich, and additive when west. The corrections can never exceed one-half the change for one day.

Pages 250—263 contain the heliocentric positions of the seven major planets, and the logarithms of their distances from the earth. The heliocentric longitude is reckoned, not from the true equinox, as in the preceding ephemerides, but from the mean equinox of the date. It is, therefore, necessary to apply nutation, if the longitude from the true equinox is required. The daily motion is given for the moment of Greenwich mean noon. The column *Reduction to Orbit* gives the correction to be applied to the heliocentric longitudes in order to obtain the longitude counted along the orbit of the planet. This longitude is equal to the distance of the node from the mean equinox, plus the distance of the planet from the node. The heliocentric latitude is counted from the moving plane of the ecliptic. The *Logarithm of Radius Vector* is the logarithm of the distance of the centre of the planet from that of the sun, at each Greenwich mean noon given in the first column. The two last columns give, in the same way, the logarithm of the true distance of the centre of the planet from that of the earth. The one column gives the quantity for the Greenwich noon indicated on the left hand side of the page, and the other for the noon which is midway between that date and the date next below it. In the case of Mercury, this intermediate date is mean noon of the day immediately following; in the case of Venus, Mars, Jupiter, and Saturn, it is mean noon of the second day following; and in the case of Uranus and Neptune, mean noon of the fourth day following.

Pages 264—271 contain the rectangular co-ordinates of the centre of the sun, referred to the centre of the earth as the origin, and to the true equator and equinox of each date as the circle and point of reference. Each co-ordinate is given first for Greenwich mean noon, and in the column following for mean midnight of the same day. The columns *Reduc. to Mean Eq'x of Jan.* 0 give the corrections to be applied to the co-ordinates for noon in order to obtain the corresponding co-ordinates referred to the mean equator and the mean equinox of January 0.

Pages 272—275 give the longitude and latitude of the moon for every Greenwich mean noon and midnight. Both quantities are referred to the true ecliptic and equinox of the date.

Pages 276 and 277 contain the position of the moon's equator and the mean longitude of the moon, and a table for computing the libration of the moon. The epochs of greatest libration of the moon, together with the formulæ for finding the libration in longitude and latitude are given on page 418.

Page 278 contains, for each tenth Greenwich mean noon, the values of the principal elements arising from the motion of the equinox, and also the aberration and parallax of the sun. The column *Apparent Obliquity of the Ecliptic* (HANSEN) gives the true inclination of the earth's equator to the ecliptic, without correction for the terms depending on the moon's longitude. The *Equation of Equinoxes* is really the astronomical nutation; that given *In Longitude* is the correction to be applied to the longitude of the body referred to the mean equinox, in order to obtain that longitude as referred to the true equinox. When the correction is positive, the true longitudes are greater than those referred to the mean equinox; while the contrary is true when the correction has the negative sign. The equation *In R. A.* is equal to that in longitude, multiplied by the cosine of the obliquity of the ecliptic.

The next column gives the *Precession of Equinoxes in Longitude*, from January 0 to each of the dates following. *The Sun's Aberration* is the quantity which is to be applied to the true longitude of the sun in order to obtain its apparent longitude. The correction being negative shows that the apparent longitude as affected by aberration is always less than the true longitude. The sun's equatorial horizontal parallax, given in the next column, is the angle subtended by the radius of the earth's equator, as seen from the centre of the sun.

PART II—THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Page 280 contains the formulæ for reducing the positions of the fixed stars, using the notation of Bessel, and the constants of Peters and Struve. The formulæ by which the star-numbers are computed are also given.

Pages 281—284 contain the logarithms of the *Besselian Star-Numbers*, A, B, C, D, for each Washington mean midnight. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at the dates for which the numbers are given. If used in accordance with the English and French notation, the pair of quantities A and B must be interchanged with the pair C and D; that is, A must be interchanged with C, and B with D. In the first column along with the solar day is given, for certain dates, the sidereal hour and tenth of midnight. The sidereal time for which any set of quantities is given can be found by interpolation from these numbers.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers: —

Computation of the apparent place of α Aquilæ for 1886, *July* 12, *for the upper transit at Washington.*

(Star-Catalogue)	log a	0.4611	log b	7.6484	log c	8.4753	log d	8.7813 *n*
(Page 283)	log A	9.6275	log B	0.9635	log C	0.8214	log D	1.2816 *n*
(Star-Catalogue)	log a'	0.9487	log b'	9.9525	log c'	9.7502	log d'	8.8197
	log Aa	0.0886	log Bb	8.6119	log Cc	9.2967	log Dd	0.0629
	log Aa'	0.5762	log Bb'	0.9160	log Cc'	0.5716	log Dd'	0.1013 *n*

		h m s		° ′ ″
Mean Place, 1886.0, (page 300)	$\alpha_0 =$	19 45 13.277	$\delta_0 =$	+ 8 34 4.34
	$Aa =$	+ 1.226	$Aa' =$	+ 3.77
	$Bb =$	+ 0.041	$Bb' =$	+ 8.24
	$Cc =$	+ 0,198	$Cc' =$	+ 3.72
	$Dd =$	+ 1.156	$Dd' =$	— 1.26
	$E =$	— 0.001	$\tau\mu' =$	+ 0.20
	$\tau\mu =$	+ 0.019		
Apparent Place, 1886, *July* 12,	$\alpha =$	19 45 15.92	$\delta =$	+ 8 34 19.01

Pages 285—292 contain the *Independent Star-Numbers*, which can be used for the same purpose. The column τ gives the fraction of the year from the beginning of the fictitious year to each date. These quantities are connected with those of Bessel by the relations given on page 280, where are also found the formulæ and precepts for the application of both systems of numbers. In order to use the Besselian numbers, it is necessary to have the values of the star-constants, a, b, c, d, a', b', c', d'. The independent star-numbers, are given in order that the apparent place of the star may be determined when it is not convenient to compute these numbers.

The following is an example of the reduction of a star to apparent place by the independent star-numbers: —

Computation of the apparent place of α Aquilæ for 1886, *July* 12, *for the upper transit at Washington.*

$\alpha_0 = 19^h\ 45^m.2$ $\delta_0 = +\ 8^\circ\ 34'.1$

$\left.\begin{array}{l} G = 3^h\ 8^m.9 \\ H = 10\ \ 43.7 \end{array}\right\}$ (Page 289) $\begin{array}{l} G+\alpha_0 = 22^h\ 54^m.1 \\ H+\alpha_0 = 6\ \ 28.9 \end{array}$

	log $\frac{1}{15}$	8.8239	log $\frac{1}{15}$	8.8239	α_0	=	$19^h\ 45^m\ 13^s.277$
(Page 289)	log g	1.0977	log h	1.3063	f	=	+ 1.302
	log sin $(G+\alpha_0)$	9.4527 n	log sin $(H+\alpha_0)$	9.9965	(g)	=	− 0.036
	log tan δ_0	9.1780	log sec δ_0	0.0049	(h)	=	+ 1.354
	log (g)	8.5523 n	log (h)	0.1316	$\tau\mu$	=	+ 0.019
					Apparent Right Ascension	=	19 45 15.92
(Page 289)	log g	1.0977	log h	1.3063			
	log cos $(G+\alpha_0)$	9.9818	log cos $(H+\alpha_0)$	9.0996 n	δ_0	=	$+\ 8^\circ\ 34'\ \ 4''.34$
	log (g')	1.0795	log sin δ_0	9.1731	(g')	=	+ 12.01
			log (h')	9.5790 n	(h')	=	− 0.38
	log i	0.4584			(i)	=	+ 2.84
	log cos δ_0	9.9951			$\tau\mu'$	=	+ 0.20
	log (i)	0.4535					
					Apparent Declination	=	+ 8 34 19.01

Pages 293—301 contain the mean places of three hundred and eighty-three stars, for the beginning of the fictitious year 1886, or the moment when the sun's mean longitude is 280°.

The annual variations are to be considered as the differential coefficients of each co-ordinate with respect to the time at the beginning of the year.

In order that the list of mean places of stars may serve the purpose of a working-catalogue for the convenient use of astronomers, the position of each of the northern circumpolar stars is given in duplicate, one position being for the upper and the other for the lower culmination. The positions for the lower culmination are marked S. P. In this case, the right ascensions are the sidereal times at which the star crosses the lower meridian; and, in order to have the expressions for the co-ordinates congruous in all cases, the declinations are counted from the equator through the north pole, and therefore exceed 90°. The time of observation and setting of the circle, in order to find a star on the meridian, are then obtained uniformly for all the stars.

Beginning with the volume for 1882, the number of stars has been greatly increased, in order to make the list more useful to field-astronomers. In order to show at a glance these additional stars, they are indicated in the list by an asterisk. *

Pages 302—313 contain the apparent positions of the four north polar stars, *α*, *δ*, and *λ* Ursæ Minoris, and 51 Cephei, for every upper transit at Washington. They include the terms depending on the moon's longitude. The mean solar time of transit is given in the column *Mean Solar Date*, in order that each transit above and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26th is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 302, we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7 But, the lower transit following that of July 1st (page 308), does not take place until July 2.3. Hence, the lower transit of July 1st precedes the upper one of the same date. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column of *Mean Solar Date.*

Pages 314—364 contain, for every tenth upper transit at Washington, the apparent places of those stars of the preceding list which are not marked with an asterisk. The mean solar date in each left hand column gives the day and tenth of the transit; so that each intermediate transit may be readily identified. Along with each co-ordinate is given, in small type, the change for ten days. This quantity is to be regarded as the differential coefficient corresponding to the dates for which the star-places are given.

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* A supplement to the Ephemeris for 1884, containing the apparent right ascensions of these additional stars for the years 1881—1884, has been issued.

Pages 365—376 contain the apparent right ascensions of all stars marked with an asterisk in the list of mean places. The apparent right ascension of each star is given only for that part of the year when it may readily be observed on the meridian. In the case of circumpolar stars, the right ascensions for lower, as well as upper, transit are given.

Pages 377—384 contain the apparent right ascension, declination, and semidiamter of the sun, and the sidereal time, all for Washington mean noon. Adjoining columns give the seconds of right ascension and of declination for apparent noon, that is, for the moment of transit of the sun's centre over the meridian of Washington. The hours and minutes of right ascension, and the degrees and minutes of declination are the same for both mean and apparent noon. In case they would have differed, the minute which would have been numerically larger is diminished by one, and the seconds increased by sixty, so that there is always a correspondence between the two numbers. The hourly motions in right ascension and declination are given for the moment of mean noon, but may be regarded as having the same values for apparent noon.

The *Equation of Time for Apparent Noon* is the correction to be applied to apparent time in order to obtain mean time. It is, therefore, mean time minus apparent time. Each number as given is the mean time of transit of the sun's centre over the meridian of Washington, counted from the nearest noon. The use of all the quantities is substantially the same as in the *Ephemeris for the Meridian of Greenwich.*

Pages 385—392 contain the right ascension, declination, semidiameter, and parallax of the moon, at the moment of transit over the meridian of Washington. The mean time given in the second column is that of transit of the moon's centre over this meridian. The differences for one hour of longitude are the amounts by which the local mean times of transit over a meridian one hour west of Washington exceed those given in the column *Mean Time of Transit*, supposing the rate of change to be uniform and equal to what it is at the moment of transit over the meridian of Washington. The next four columns need no especial explanation, except that the differences for one hour of longitude are computed as if the motion of the moon in right ascension were uniform. By means of them, the position of the moon can be computed with astronomical accuracy at the moment of transit over any meridian not exceeding one hour in longitude from that of Washington, by taking account of second differences. With greater longitudes of the place, the accuracy of the result obtained in this way will diminish. The columns of sidereal time of semidiameter passing meridian, etc., do not seem to need any explanation, except that they all refer to the moment of transit. The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When two opposite limbs are both so nearly full that they can be well observed, both are indicated; and the one which is deficient is printed in smaller type. When the illumination is so nearly equal that no choice can be made between them, both are printed in large type.

Pages 393—409 contain the geocentric apparent right ascensions and declinations of the seven major planets, and their semidiameters and horizontal parallaxes, for the moments of all those transits over the meridian of Washington which can be observed.

PART III—PHENOMENA.

This portion of *The American Ephemeris and Nautical Almanac* gives the principal astronomical phenomena of the year, reduced to Washington mean time, except in the case of the eclipses and the data for the rings of Saturn, which are given in Greenwich mean time.

Pages 412—416 inclusive contain the elements necessary for computing the two eclipses of the sun which occur during the year.

The eclipse-elements are given for the moment of conjunction of the sun and moon in right ascension. The subsequent tables and results are not, however, computed from these elements unchanged; but from the accurate positions of the two bodies as interpolated for each hour of the eclipse. The principal circumstances of each eclipse are as follow:—

On the line "Eclipse begins" is given the Greenwich mean time at which the earth first touches the moon's penumbra, and the longitude and latitude of the point of touching.

The "Central eclipse begins" when the axis of the moon's shadow first touches the earth, and the longitude and latitude of the point of touching follow.

"Central eclipse at noon" indicates the moment when the axis of the shadow is coincident with the plane of the meridian at the point of its intersection with the earth's surface. To the observer at this point, the eclipse will be central at the moment of apparent noon.

"Central eclipse ends" and "Eclipse ends" have the converse meaning of the beginning.

Maps of the Eclipses.—The regions in which each eclipse is visible are shown upon the maps given in connection with them. From these maps may also be derived the approximate determination of the times of beginning and ending, and of the magnitude of the eclipses at any place. The dotted curves show the outlines of the shadow for each hour of Greenwich mean time and therefore pass through all the places where the eclipse begins or ends at that hour. To find at what hour the eclipse begins at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between these two hours of Greenwich mean time: the fraction of the hour may be determined by dividing the hour proportionally to the space which it represents on the map. This division may be a little more exact by allowing for the changes in this space as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the time at which the eclipse of 1886, March 5, begins at San Francisco.

We find this point to be situated between the curves of 10 hours and 11 hours, but a little nearer to the former than to the latter. Comparing the distance of the place from the former curve with the distance between the curves of 10 hours and 11 hours we find it to correspond to about 29 minutes, and increasing this by one minute because the distance between the curves is increasing, we have for time of beginning $10^h\ 30^m$—which is probably within 2 or 3 minutes of the truth. In the same way we find the approximate time of ending to be $12^h\ 42^m$.

Changing to local time the result will be:—

		Beginning.		Ending.	
		h	m	h	m
Greenwich mean time	March 5,	10	30	12	42
Longitude west of Greenwich		8	9.6	8	9.6
Local mean time		2	20.4 ± 2^m	4	32.4 ± 2^m

In the case of total and annular eclipses, a rough estimate of the magnitude of the eclipse may be obtained from the position of the place relatively to the central line and to the limit. On the central line, the eclipse is annular or total; while on the limit, the limb of the moon only grazes that of the sun.

More Accurate Computations.—A more accurate determination of the phases as visible at any point of the earth's surface may be obtained from the Besselian elements, which are given for every ten minutes of Greenwich mean time. Their geometric signification is as follows:—

Let us imagine a plane passing through the centre of the earth, perpendicular to the right line joining the centres of the sun and moon. This latter line is the axis of the moon's shadow, and the plane is called the *fundamental plane*. We take the intersection of this plane with that of the earth's equator as the axis of X, and the centre of the earth as the origin of co-ordinates. The axis of Y is perpendicular to that of X, and directed toward the north. x and y are then the co-ordinates of the point in which the axis of the shadow intersects the fundamental plane. The angle d, of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; this direction being that from the earth toward the moon and sun. The angle μ is the Greenwich hour-angle of this same point of the celestial sphere.

The quantities l and l' are the radii of the shadow-cones upon the fundamental plane, l corresponding to the penumbra, and l' to the umbra, or annulus. The notation is that of CHAUVENET's *Spherical and Practical Astronomy*, in which l' is regarded as positive for an annular, and negative for a total, eclipse.

The angles f and f', the tangents of which are given, are the angles which each element of the respective shadow-cones makes with the axis of the shadow; or, they are the semi-angles of the two cones.

At the bottom of the table are given the logarithms of the change of x, y and μ, in one minute, in order to facilitate the interpolation to any required moment.

The method of computing the eclipse from the given elements is as follows: It is premised that the moments of beginning and ending are those at which the distance of the observer from the axis of the shadow or penumbra is equal to the radius of the latter at the point of observation. To find such distance and radius we compute—

(1) The co-ordinates, ξ, η, and ζ, of the observer, at some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase, together with their variations for one minute.

(2) The co-ordinates x and y of the axis of the shadow at the same moment, which, with their variations for one minute, are taken from the tables of elements.

(3) Hence, the position and motion of the observer relative to the axis of the shadow.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer.

(5) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to this radius.

The formulæ and directions for the several steps in the computation are as follow:—

(1) Find the geocentric co-ordinates of the station referred to the earth's equator, which are represented by $\rho \cos \varphi'$ and $\rho \sin \varphi'$, ρ being the distance from the centre of the earth, and φ' the geocentric latitude. These may be obtained from geodetic tables, or may be computed from the following table by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

φ being, as usual, the geographic latitude.

Table for Computing the Geocentric Co-ordinates of a Place.

φ	Log F.		Log G.	
0°	0.00000		0.00302	
5	0.00001	1	0.00300	2
10	0.00005	4	0.00297	3
15	0.00010	5	0.00292	5
20	0.00018	8	0.00284	8
25	0.00027	9	0.00275	9
30	0.00038	11	0.00264	11
35	0.00050	12	0.00252	12
40	0.00062	12	0.00239	13
45	0.00075	13	0.00226	13
50	0.00088	13	0.00213	13
55	0.00101	13	0.00201	12
60	0.00113	12	0.00189	12
65	0.00124	11	0.00178	11
70	0.00133	9	0.00169	9
75	0.00141	8	0.00161	8
80	0.00146	5	0.00155	6
85	0.00150	4	0.00152	3
90	0.00151	1	0.00151	1

For the assumed Greenwich mean time of computation, take from the table of elements the values of sin d, cos d, and μ. Put:

λ, the longitude west from Greenwich. The co-ordinates of the observer will then be:—

$$\xi = \rho \cos \varphi' \sin (\mu - \lambda)$$
$$\eta = \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda)$$
$$\zeta = \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda)$$

and their variations in one minute of mean time will be:—

$$\xi' = [7.6398]\, \rho \cos \varphi' \cos (\mu - \lambda)$$
$$\eta' = [7.6398]\, \rho \cos \varphi' \sin d \sin (\mu - \lambda) = [7.6398]\, \xi \sin d$$

ζ' is not wanted.

(2) The co-ordinates x and y of the axis of the shadow are taken from the tables of elements for the same assumed moment of Greenwich mean time, together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. The variations for one minute we represent by x' and y'. Their logarithms are given at the foot of the tables.

(3) The distance m and position-angle M of the axis of the shadow relative to the observer, and the relative motions, n and N, are computed by the formulæ:—

$$m \sin M = x - \xi$$
$$m \cos M = y - \eta$$
$$n \sin N = x' - \xi'$$
$$n \cos N = y' - \eta'$$

(4) The radius L of the shadow or penumbra at the distance ζ from the fundamental plane is computed by the formula

$$L = l - \zeta \tan f$$

l and f being found in the table of elements, and ζ computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or end of the eclipse, we shall have—

$$m = L$$

But, as this condition can scarcely ever be fulfilled on a first trial, a correction τ to the assumed time is computed thus: Find the angle ψ from the equation,

$$\sin \psi = \frac{m \sin (M - N)}{L}$$

There will be two values to this angle, of which one will be in the first and the other in the second quadrant when sin ψ is positive, and one in the third and the other in the fourth when sin ψ is negative. But, simplicity will be gained by taking only that value of ψ for which cos ψ is positive. This value lies between the limits $+90°$ and $-90°$. The correction τ to the assumed time will be found in minutes, from—

For beginning: $$\tau = -\frac{m \cos (M - N)}{n} - \frac{L \cos \psi}{n}$$

For ending: $$\tau = -\frac{m \cos (M - N)}{n} + \frac{L \cos \psi}{n}$$

One such pair of values of τ cannot, however, give the times of both beginning and ending with accuracy. To attain accuracy we must, in commencing the computation, assume two times, one as near as practicable to that of beginning, and another near that of ending. These approximate times may be derived from the chart of the eclipse. We shall thus have two pairs of values of τ. The computation for the first assumed time will give a small and nearly correct value for the beginning of the eclipse, and a large value which, added to the assumed time, will give an inaccurate time of ending. The computation for the second assumed time will give a small and nearly correct value for the end, and a large negative and inaccurate one for the beginning. We shall thus deduce two times of beginning and two of ending, of each of which only one is to be considered approximately correct.

The more accurate times of beginning and ending may now be taken in place of the first assumed ones, and the computation may be repeated from the beginning, leading to a pair of values of τ, which should be very small and accurate. Such a repetition of the computation will in general be advisable, to guard against accidental numerical errors. The following theorem will, however, enable us to obtain a second approximation to the true times of each phase without repeating the computation.

THEOREM.—*The error of each result is approximately proportional to the square of the correction* τ, *multiplied by the sine of the sun's hour-angle*, $(\mu-\lambda)$, *for the middle of the interval between the time of computation and that of the phase.*

To apply this theorem we find the two values of $\tau^2 \sin(\mu-\lambda)$ corresponding to the required phase. We then find the ratio of these quantities—which will commonly be a large number, and divide the difference of the results by this ratio. The quotient will be a correction to be applied to the more accurate result in such a way as to make it deviate yet more from the less accurate one. This correction should be positive in the local forenoon, and negative in the afternoon, and its value should never materially exceed $0^{\mathrm{m}}.001\,\tau^2$.

Unless the times chosen for computation are unusually in error, say ten minutes or more, the corrected results thus obtained will be theoretically correct within less than a second. But to guard against numerical errors it is better, after making this final correction, to repeat the computations so far as to obtain new values of m and L for the corrected times. If these two quantities agree within a unit of the fourth place of decimals, the times employed are generally correct within a second of time. If they differ too widely, farther corrections and recomputations may be made by the computer according to his own judgment.

It may be remarked that the uncertainty of the ephemerides is such that a prediction may be several seconds in error from this unavoidable cause alone.

Position-angle of Point of Contact.—The position-angle, P, of the point of contact, reckoned from the north point of the sun's limb toward the east, is found by the formula

For beginning: $P = N - \psi \pm 180°$
For end: $P = N + \psi$

it being assumed that, in each case, the value of ψ is taken between the limits $\pm 90°$.

Computation of the eclipse of 1886, March 5, for a point in

Latitude, $\varphi = +\ 37°\ 48'.6$
Longitude, $\lambda = +\ 122°\ 24'\ 40''$

in or near San Francisco, California.

Constants for the given place:—

$\log \rho \cos \varphi' = 9.89822 \qquad \log \rho \sin \varphi' = 9.78509$

From the Eclipse Chart we find for the *approximate* times of the phases as follows:—

	h	m	
Beginning . . .	10	30	Greenwich Mean Time.
Ending . . .	12	40	

We will therefore assume for the first approximation

		Beginning.	Ending.
(Greenwich Mean Time)		$10^{\mathrm{h}}\ 32^{\mathrm{m}}$	$12^{\mathrm{h}}\ 45^{\mathrm{m}}$
(Page 413)	μ	155° 6′ 54″	188° 22′ 24″
	λ	122 24 40	122 24 40
	$\mu - \lambda$	32 42 14	65 57 44
	$\rho \cos \varphi'$	9.89822	9.89822
	$\sin(\mu-\lambda)$	9.73263	9.96060
	$\log \xi$	9.63085	9.85882
	ξ	+ 0.42742	+ 0.72247

			Beginning.		Ending.
	$\rho \sin \varphi'$		9.78509		9.78509
	$\cos d$		9.99778		9.99780
	$\log \rho \sin \varphi' \cos d$		9.78287		9.78289
(1)	$\rho \sin \varphi' \cos d$	+	0.60656	+	0.60660
	$\rho \sin \varphi'$		9.89822		9.89822
	$\sin d$		9.00410 *n*		9.00148 *n*
	$\cos (\mu-\lambda)$		9.92504		9.60996
	$\log \rho \sin \varphi' \sin d \cos (\mu-\lambda)$		8.82736 *n*		8.50966 *n*
(2)	$\rho \sin \varphi' \sin d \cos (\mu-\lambda)$	−	0.06720	−	0.032334
(1)−(2)	η	+	0.67376	+	0.638934
	$\rho \sin \varphi'$		9.78509		9.78509
	$\sin d$		9.00410 *n*		9.00148 *n*
	$\log \rho \sin \varphi' \sin d$		8.78919 *n*		8.78657 *n*
(3)	$\rho \sin \varphi' \sin d$	−	0.06154	−	0.061174
	$\log \rho \cos \varphi' \cos (\mu-\lambda)$		9.82326		9.50818
	$\cos d$		9.99778		9.99780
	$\log \rho \cos \varphi' \cos d \cos (\mu-\lambda)$		9.82104		9.50598
(4)	$\rho \cos \varphi' \cos d \cos (\mu-\lambda)$	+	0.66230	+	0.32061
(3)+(4)	ζ	+	0.60076	+	0.259436
	$\log \rho \cos \varphi' \cos (\mu-\lambda)$		9.82326		9.50818
	$\log \mu'$ (constant)		7.63992		7.63992
	$\log \xi'$		7.46318		7.14810
	ξ'	+	0.002905	+	0.001406
	$\log \xi$		9.63085		9.85882
	$\sin d$		9.00410 *n*		9.00148 *n*
	$\log \mu'$ (constant)		7.63992		7.63992
	$\log \eta'$		6.27487 *n*		6.50022 *n*
	η'	−	0.000188	−	0.000316
(Page 413)	x	+	0.18741	+	1.26827
	ξ	+	0.42742	+	0.72247
	$x-\xi$	−	0.24001	+	0.54580
	y	+	0.15825	+	0.48864
	η	+	0.67376	+	0.63893
	$y-\eta$	−	0.51551	−	0.15029
	x'	+	0.008128	+	0.008126
	ξ'	+	0.002905	+	0.001406
	$x'-\xi'$	+	0.005223	+	0.00672
	y'	+	0.002483	+	0.002485
	η'	−	0.000188	−	0.000316
	$y'-\eta'$	+	0.002671	+	0.002801
	l		.56949		.56933
	$\log \tan f$		7.67320		7.67319
	$\log \zeta$		9.77870		9.41408
	$\log \zeta \tan f$		7.45190		7.08722
	$\zeta \tan f$		.002831		.001222

	Beginning.	Ending.
$L = l - \zeta \tan f$	0.566659	0.568108
$\log(x-\xi)$	9.38023 n	9.73703
$\log(y-\eta)$	9.71224 n	9.17693 n
$\tan M$	9.66799	0.56010 n
M	204° 58′	105° 23′ 43″
$\sin M$	9.62540 n	9.98413
$\log m$	9.75483	9.75290
$\log(x'-\xi')$	7.71792	7.82737
$\log(y'-\eta')$	7.42667	7.44731
$\tan N$	0.29125	0.38006
N	62° 55′	67° 22′ 25″
$\cos N$	9.65828	9.58515
$\log n$	7.76839	7.86216
$M-N$	142° 3′	38° 1′ 18″
$\sin(M-N)$	9.78886	9.78955
$\log m$	9.75483	9.75290
	9.54369	9.54245
$\log L$	9.75332	9.75443
$\sin \psi$	9.79037	9.78802
ψ	38° 6′ 24″	37° 51′ 50″
$\log \frac{m}{n}$	1.98644	1.89074
$\cos(M-N)$	9.89683 n	9.89640
$\log \frac{m}{n} \cos(M-N)$	1.88327 n	1.78714
$\therefore -\frac{m}{n}\cos(M-N)$	+ 76.430	− 61.254
$\log L$	9.75332	9.75443
$\cos \psi$	9.89590 n	9.89734
	9.64922 n	9.65177
$\log n$	7.76839	7.86216
$\log \frac{L}{n} \cos \psi$	1.88083 n	1.78961
$\frac{L}{n} \cos \psi$	− 76.004	+ 61.604
τ	+ 0^{m}.426	+ 0^{m}.350
t	10^{h} 32^{m}.000	12^{h} 45^{m}.000
T	10^{h} 32.^{m}426	12^{h} 45^{m}.350

As the assumed times are very near the computed times no correction is necessary. Therefore we have

	h	m	s	
Beginning of eclipse	10	32	25.5	Greenwich Mean Time.
End of eclipse	12	45	21.0	

Angle of position:

	Beginning.		End.	
N	62°	55′	67°	22′.4
$\psi \quad (+180°)$	218	6.4	37	51.8
P	204	48.6	105	14.2

Elements of Occultations.—Pages 418—444 give the elements for the prediction of the times of occultation of stars and planets by the moon. In the columns referring to the star, those headed *Red'ns from* 1886.0 give the quantities necessary to reduce the mean place of the star at the beginning of 1886 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

The quantities in the following five columns are all given for the moment of geocentric conjunction of the star and moon in right ascension. Let there be a line passing from the star through the centre of the moon, and let a plane perpendicular to this line pass through the centre of the earth: this plane will be the fundamental plane for the occultation. The system of co-ordinates is similar to that already described for eclipses. The cone circumscribing the moon and star may be regarded as a cylinder having everywhere the same diameter as the moon. This cylinder will intercept the fundamental plane in a circle of which the linear diameter will be the same as that of the moon.

The *Washington Mean Time* is the moment at which the two bodies are in geocentric conjunction in right ascension. At this moment the co-ordinate x of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour-Angle H* gives the common geocentric hour-angle of the moon and star at the same moment, counted from the meridian of Washington—positive toward the west and negative toward the east. Column Y gives the co-ordinate y of the axis of the cylinder upon the fundamental plane at the same moment. Columns x' and y' give the hourly variation of x and y. The linear unit in these columns is the earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the Washington mean time of immersion and emersion of a star behind the limb of the moon may be computed for any part of the earth by a method nearly the same as that already explained for computing eclipses, only more simple.

We shall first show how to compute an isolated occultation for a particular place, assuming it to be visible at that place, and then show how all the occultations which will be visible at a place may be selected and computed by a more rapid process.

(1) The geocentric co-ordinates of the place, $\rho \sin \varphi'$ and $\rho \cos \varphi'$, are to be computed with three or four places of decimals by the formulæ,

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

$$\rho \cos \varphi' = F \cos \varphi$$

already given in connection with the eclipses.

As in the case of eclipses, it is necessary to have an approximate time of the phenomenon, corresponding to that obtained from the charts of the eclipses. The quantity H being the Washington west hour-angle of the two bodies at the moment of geocentric conjunction, $H - \lambda$ will be the local hour-angle of the star at this same moment. Let us call this angle h_0, putting

$$h_0 = H - \lambda$$

The next step will then be to find the approximate moment of apparent conjunction in right ascension as seen from the place. An approximate correction to reduce the time and hour-angle for geocentric conjunction to those for apparent conjunction may be taken from Mr. DOWNES's table, on pages 448—449. This correction will have the same sign as h_0.

When this table is not available, the correction may be computed thus: Compute the quantities ξ_0, ξ', and τ from the formulæ,

$$\begin{aligned} \xi_0 &= \rho \cos \varphi' \sin h_0 \\ \xi' &= [9.4192] \cos \left(h_0 + \tfrac{1}{8} h_0\right) \\ \tau &= \frac{\xi_0}{x' - \xi'} \end{aligned}$$

τ will then be the approximate interval between the times of geocentric and local conjunction. By applying it to the Washington mean time of the former, as given with the elements, we shall have the Washington mean time of the latter within a few minutes.

The average duration of an occultation is about an hour. Thence, by adding $0^h.5$ to and subtracting it from the mean time of apparent conjunction, we shall have rough times of the phases of immersion and emersion for farther computation. Let us then put,

$\tau_1 = \tau - 0^h.5$
$\tau_2 = \tau + 0^h.5$
T, the Washington mean time of geocentric conjunction in R. A.
d, the declination of the star.

(2) Compute for the moments $T + \tau_1$ and $T + \tau_2$ the following quantities, in which we write τ for each of the quantities τ_1 and τ_2. The latter, when used as angles, are to be changed to arc by multiplying by 15°, and the minutes are to be further increased by one-sixth the number of degrees in order to reduce to the sidereal hour-angle.

$$\begin{aligned}
\xi &= \rho \cos \varphi' \sin (h_0 + \tau) \\
\eta &= \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (h_0 + \tau) \\
\xi' &= [9.4192]\, \rho \cos \varphi' \cos (h_0 + \tau) \\
\eta' &= [9.4192]\, \rho \cos \varphi' \sin d \sin (h_0 + \tau) = [9.4192]\, \xi \sin d \\
x &= x' \tau \\
y &= Y + y' \tau
\end{aligned}$$

Compute m, M, n and N from the equations

$$\begin{aligned}
m \sin M &= x - \xi \\
m \cos M &= y - \eta \\
n \sin N &= x' - \xi' \\
n \cos N &= y' - \eta' \\
n' &= \frac{n}{60} = [8.2218]\, n \\
\sin \psi &= [0.5650]\, m \sin (M - N)
\end{aligned}$$

Then, t_1 and t_2 from the equations

$$t_1 = -\frac{m}{n'} \cos (M - N) - \frac{[9.4350]}{n'} \cos \psi \quad \text{(Beginning.)}$$

$$t_2 = -\frac{m}{n'} \cos (M - N) + \frac{[9.4350]}{n'} \cos \psi \quad \text{(End.)}$$

The quantities t_1 and t_2 will then be the corrections in minutes to be applied to the respective times $T + \tau_1$ and $T + \tau_2$ to obtain the Washington mean times of the phases.

As in the case of eclipses, the small value of t_1 will give an accurate result for one phase, and the large value an inaccurate result for the other. Both accurate results may then be corrected by comparison with the inaccurate one, in the way described for eclipses, and a result obtained which will probably be correct within a fraction of a minute of time.

As a check upon the result, it will be advisable to compute ξ, η, x and y for the moments finally obtained. If the times are correct these quantities will fulfil the condition,

$$\sqrt{(x - \xi)^2 + (y - \eta)^2} = 0.2723$$

If log $m \sin (M - N) = 9.4350$ nearly, a recalculation will generally be necessary to determine whether, numerically, $\sin \psi < 1$, or $\sin \psi > 1$. In the latter case, the impossible value of $\sin \psi$ indicates that an occultation at the given place is impossible, unless the computed distance from the moon's limb is within the errors of the ephemerides of the moon and star.

In such cases of near approach to the moon's limb, we may take $\psi = 90°$, or $270°$, according as $\sin (M - N)$ is positive or negative; and for finding the time of nearest approach,

$$t = -\frac{m \cos (M - N)}{n'}$$

Putting π for the moon's horizontal parallax, the distance from the moon's limb will be,

$$\pi\,[\,m \sin\,(\,M - N) - 0.2723\,]$$

disregarding the sign of $\sin\,(\,M - N)$; or, allowing for the augmentation of the semidiameter,

$$\pi\,[m \sin\,(\,M - N\,) - 0.2723\,]\;[1 + z \sin \pi\,]$$

where

$$z = \rho \cos \varphi' \cos d \cos\,(h_0 + \tau) + \rho \sin \varphi' \sin d$$

The position-angle, P, of the line from the moon's centre to the star at the times of contact, reckoned from the north point toward the east, is given by the formulæ: —

$$P = N - \psi \qquad \text{for immersion,}$$
$$P = N + \psi \pm 180^\circ \qquad \text{for emersion,}$$

it being supposed that the value of ψ, in each case, is taken between the limits $\pm 90^\circ$.

To find the angle from the vertex, we compute the angle C from the formula,

$$\tan C = \frac{\xi + t\,\xi'}{\eta + t\,\eta'}$$

in which the value of t corresponding to the phase is to be used. Then

$$V = P - C$$

is the angle from the vertex, also reckoned from the north toward the east.

As an example of an isolated occultation, we shall compute that of α Tauri, 1886, November 12, for Clinton, New York, whose position is —

$$\varphi = +\,43^\circ\;3'\;17''$$
$$\lambda = -\;\;0^h\;6^m\;34^s.65$$

Constants for the given place $\quad\log \rho \sin \varphi' = 9.8319 \quad \log \rho \cos \varphi' = 9.8645$

From the table of elements, page 440 $\quad H = -\,0^h\,23^m.3$

Hence $\quad h_0 = H - \lambda = -\,0^h\,16^m.7$

From the equations on page 507, the correction for the time of apparent conjunction is found to be $-\,10^m$. Applying this to the Washington mean time of geocentric conjunction, as given in the elements (page 440), we have the approximate mean time of apparent conjunction, $12^h\,27^m$. As the occultation is nearly central, the duration will considerably exceed the average period; we will therefore subtract and add 40 minutes, and we shall have the approximate Washington times of immersion and emersion, to be used in the computation; thus,

$$\text{Immersion,} \quad \tau_1 = -\,\overset{m}{50}; \qquad T_1 = \text{Nov. } 12,\ \overset{h}{11}\ \overset{m}{47}$$
$$\text{Emersion,} \quad \tau_2 = +\,30; \qquad T_2 = \text{Nov. } 12,\ 13\ \ 7$$

		Immersion.		Emersion.
		h m		h m
h_0	$-$	0 16.7	$-$	0 16.7
τ (reduced to sidereal time)	$-$	50.137	$+$	30.082
$h_0 + \tau$	$-$	1 6.837	$+$	0 13.382
$h_0 + \tau$ (in arc)	$-$	$16^\circ\,42'.5$	$+$	$3^\circ\,20'.7$
$\sin d$		9.44768		9.44768
$\cos d$		9.98224		9.98224
$\rho \cos \varphi'$		9.86450		9.86450
$\sin\,(h_0 + \tau)$		9.45864 *n*		8.76605
$\log \xi$		9.32314 *n*		8.63055
ξ	$-$	0.21044	$+$	0.04271
$\rho \sin \varphi'$		9.83190		9.83190
$\cos d$		9.98224		9.98224
$\rho \sin \varphi' \cos d$		9.81414		9.81414
(1)	$+$	0.65184	$+$	0.65184

	Immersion.	Emersion.
$\rho \cos \varphi' \sin d$	9.31218	9.31218
$\cos (h_0 + \tau)$	9.98127	9.99926
$\rho \cos \varphi' \sin d \cos (h_0 + \tau)$	9.29345	9.31144
(2)	+ 0.19654	+ 0.20485
(1)−(2) η	+ 0.45530	+ 0.44699
(const.) log	9.41920	9.41920
$\rho \cos \varphi' \cos (h_0 + \tau)$	9.84577	9.86376
$\log \xi'$	9.26497	9.28296
ξ'	+ 0.18406	+ 0.19185
(const.) log	9.41920	9.41920
$\xi \sin d$	8.77082 *n*	8.07823
$\log \eta'$	8.19002 *n*	7.49743
η'	− 0.01549	+ 0.00314
$x = x' \tau$	− 0.47668	+ 0.28600
ξ	− 0.21044	+ 0.04271
$x - \xi$	− 0.26624	+ 0.24329
$y = Y + y' \tau$	+ 0.42548	+ 0.54935
$y - \eta$	− 0.02982	+ 0.10236
$x' - \xi'$	+ 0.38794	+ 0.38015
$y' - \eta'$	+ 0.10839	+ 0.08976
$\log m \sin M$	9.42526 *n*	9.38612
$\log m \cos M$	8.47451 *n*	9.01013
$\tan M$	0.95075	0.37599
M	263° 36′ 33″	67° 10′ 55″
$\cos M$	9.04653 *n*	9.58862
$\log m$	9.42798	9.42151
$\log n \sin N$	9.58876	9.57995
$\log n \cos N$	9.03499	8.95308
$\tan N$	0.55377	0.62687
N	74° 23′ 22″	76° 42′ 52″
$\cos N$	9.42992	9.36135
$\log n$	9.60507	9.59173
	8.22180	8.22180
$\log n'$	7.82687	7.81353
$M - N$	189° 13′ 11″	− 9° 31′ 57″
$\sin (M - N)$	9.20472 *n*	9.21907 *n*
$\log m$	9.42798	9.42151
const. log	0.56500	0.56500
$\sin \psi$	9.19770 *n*	9.20558 *n*
ψ	189° 4′ 14″	− 9° 14′ 18″
$\cos (M - N)$	9.99436 *n*	9.99396
$\log \frac{m}{n'}$	1.60111	1.60798
$\cos \psi$	9.99454 *n*	9.99434
[9.4350] ÷ n'	1.60813	1.62147

	Immersion.	Emersion.
$-\frac{m}{n'}\cos(M-N)$	$+$ 39.398	$-$ 39.990
$\frac{[9.4350]}{n'}\cos\psi$	$\pm$ 40.057	$\pm$ 41.287
t_1	.. 0.659	$+$ 1.297
t_2 (inaccurate)	$+$ 79.455	$-$ 81.277
	h m	h m
Washington conjunction $+ \tau$	11 47.00	13 7.00
Washington mean time of phase Nov. 12,	11 46.341	13 8.297
$-\lambda$	$+$ 6.577	$+$ 6.577
Clinton mean time of phase Nov. 12,	11 52.918	13 14.874

These times being very near the assumed ones, require no correction. When a correction is considered necessary, it may be computed in the same way as described for eclipses, but for the mere purpose of prediction, it need be executed only for the emersion.

For the position angles we have

	Immersion.	Emersion.
N	74° 23′.4	76° 42′.9
ψ	189 4.2	$-$ 9 14.3
	$-$ 180	$+$ 180
Q	83 27.6	247 28.6

Prediction of Many Occultations for a Given Place.—When it is desired to predict all the occultations which will be visible at some one place, tables may be constructed and applied in such a way as to greatly diminish the labor of computation. In using such tables, the most convenient course will be to find for each occultation the hour-angle of the star at the moment of apparent conjunction in right ascension, as seen from the place of observation. The table of elements, pages 418—444, gives H, the Washington hour-angle at the moment of geocentric conjunction. The corresponding geocentric hour-angle at the place will be—

$$h_0 = H - \lambda \qquad (\lambda = \text{west longitude from Washington}).$$

The moment of apparent conjunction, as seen from the station, will be given by the condition $\xi = x$; or, using the values of ξ and x,

$$\rho \cos \varphi' \sin h = x' \tau$$

h being the west hour-angle of the star at the moment in question, and τ the interval, in hours of mean time, which has elapsed since geocentric conjunction. We shall therefore have,

$$h = h_0 + \tau$$

for the hour-angle at the end of the interval τ after geocentric conjunction. In strictness, τ should here be multiplied by the factor $1 + \frac{1}{365.25}$, because the star moves a little more than 15° in an hour of mean time; but the error arising from the neglect of the factor is too small to be important, as it will affect the predicted time of conjunction by less than 10 seconds. The equation for finding τ is therefore,

$$\rho \cos \varphi' \sin (h_0 + \tau) = x' \tau$$

The quantities h_0 and x' being derived immediately from the data of the Ephemeris, the quantity τ is readily obtained by successive approximation, and may be tabulated as a function of h_0 and x'. The computation of τ is effected as follows: We have

$$\sin (h_0 + \tau) = \sin h_0 + 2 \sin \tfrac{1}{2} \tau \cos (h_0 + \tfrac{1}{2} \tau) \qquad (1)$$

The value of τ in arc being seldom more than 24° we have put τ itself for $2 \sin \frac{1}{2} \tau$. The equation will then become

$$\rho \cos \varphi' \sin h_0 + \tau \rho \cos \varphi' \cos (h_0 + \tfrac{1}{2} \tau) = x' \tau$$

from which we find

$$\tau = \frac{\rho \cos \varphi' \sin h_0}{x' - k \rho \cos \varphi' \cos (h_0 + \frac{1}{2} \tau)} \tag{2}$$

To tabulate τ, we must first have a table of the quantities

$$\begin{aligned} \xi &= \rho \cos \varphi' \sin h \\ \xi' &= [9.41916] \rho \cos \varphi' \cos h \end{aligned} \tag{3}$$

which table may be formed for every 10 minutes (in time) of h. If we then put ξ_0 for the value of ξ corresponding to $h = h_0$, and ξ'_1 for the value of ξ' corresponding to $h = h_0 + \frac{1}{2} \tau$, we shall have

$$\tau = \frac{\xi_0}{x' - \xi'_1} \tag{4}$$

Since we must know the value of τ, approximately, before we can take ξ'_1 from the table, this equation can be solved only by successive approximations. The approximations converge so rapidly as to offer no difficulty. It will be best to begin by computing values of τ for the two extremes of x', namely, $x' = 0.48$ and $x' = 0.60$, because the approximate values of τ can then be interpolated for all intermediate values of x'. For the first approximation may be taken—

$$\begin{aligned} \tfrac{1}{2} \tau &= 50^{\mathrm{m}} \sin \frac{4}{3} h_0 \quad (\text{for } x' = 0.48) \\ \tfrac{1}{2} \tau &= 40^{\mathrm{m}} \sin \frac{4}{3} h_0 \quad (\text{for } x' = 0.60) \end{aligned} \tag{5}$$

or, the approximate values of τ may be taken from Mr. DOWNES's table, pages 448—449. It will be best to make the computation for every 30^{m} of h_0, and to find the intermediate values of τ for every 10^{m} by interpolation. Then for each 30^{m} of h_0 we take ξ' from a table with the argument $h_0 + \frac{1}{2} \tau$, and $\log \xi$ with the argument h_0, and thence compute τ by (4). If the value of τ thus arrived at differs more than 3^{m} from that employed in taking out ξ', a new value may be used to correct ξ', and the computation may be repeated. The values corresponding to $x' = 0.51$, $x' = 0.54$, and $x' = 0.57$, can then be computed with the single interpolation of approximate values of τ, and afterward the table can be extended by interpolation to every 0.01 of x' between $x' = 0.48$ and $x' = 0.62$. It will be best to compute τ in the first place to every 0.001 of an hour, and to drop the last figure in forming the definitive table. We shall call the table thus formed *Table I.*

The values of η and η' may then be tabulated for every degree of the star's declination, and every 10^{m} of h. It will not be really necessary to compute the table for negative values of d, since by putting

$$\begin{aligned} \eta_1 &= \quad \rho \sin \varphi' \cos d \\ \eta_2 &= - \rho \cos \varphi' \sin d \cos h \end{aligned}$$

η_1 may be given in a table of single-entry; and taking η_2 from the table of double-entry for a positive d, we shall have

$$\eta = \eta_1 \pm \eta_2$$

the lower sign being used for a negative d. But the extension of the table for η to negative values of d is so readily made that it will probably be found better to do it, so as to save taking out η_1 and η_2 separately.

We shall call this table for η *Table II*, and the corresponding one for η' with the same arguments *Table III.* The precepts for using the tables will then be as follow:—

From Table I with the arguments x' and $H - \lambda = h_0$ take out the value of τ. It will be sufficient to use the nearest 0.01 of x'. τ will be of the same sign as h_0. Then, enter Table II with the arguments d (the star's declination) and $h = h_0 + \tau$, and take out the value of η.

Form the quantities $y = Y + y'\tau,$ and $y - \eta$. If the latter quantity lies between the limits ± 0.28, it is almost certain that there will be an occultation. If it falls without the limits ± 0.33, it is almost certain that there will not be an occultation. Between the years 1881 and 1890 these last limits may be reduced to ± 0.32, and cases near this limit may be rejected if y' is small. A convenient rule to adopt will be —

$$y' < 0.10, \quad \text{limits} = \pm 0.29$$
$$10 < y' < 0.15, \quad \text{limits} = \pm 0.30$$
$$15 < y' < 0.20, \quad \text{limits} = \pm 0.31$$
$$20 < y' \quad \text{limits} = \pm 0.33 \text{ or } \pm 0.32$$

Here, only the absolute value of y' is to be considered, without respect to its algebraic sign.

If $y - \eta$ falls between the limits thus indicated, take the values of ξ' and η' from the appropriate tables and compute v, Q and Δ from the equations

$$v \sin Q = y' - \eta'$$
$$v \cos Q = x' - \xi'$$
$$\Delta = (y - \eta) \cos Q$$

If $\Delta > 0.2723$ or $\log \Delta > 9.4350$ there will be no occultation, or, at best, the moon will only graze the star when $\Delta - 0.2723$ is very small. If $\Delta < 0.2723$, compute

$$\tau_1 = -\frac{y - \eta}{v} \sin Q \qquad \cos P = \frac{\Delta}{0.2723} \qquad (P < 180^\circ)$$
$$\tau_2 = \frac{0.2723 \sin P}{v}$$

We shall then have —

Local mean time of immersion, $T - \lambda + \tau + \tau_1 - \tau_2$
Local mean time of emersion, $T - \lambda + \tau + \tau_1 + \tau_2$
Position-angle from north toward east at immersion, $180^\circ - Q - P$
Position-angle from north toward east at emersion, $180^\circ - Q + P$

In predicting the occultations for a given place, the first operation will be to go over the list of occultations in the Ephemeris, and select those which may be visible. The conditions of possible visibility are: —

1. The limiting parallels in the last columns must include the latitude of the place.

2. The quantity $H - \lambda$, taken without regard to sign, must be less than the semi-diurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east horizon, or an immersion in the west, when this difference is a few minutes less than an hour.

3. The sun must not be much more than an hour above the horizon at the local mean time $T - \lambda$, unless the star is bright enough to be seen in the day time.

The most convenient course will be to write the value of $-\lambda$ on the bottom of a sheet of paper, and, passing through the list of occultations, pause over each one for which condition (1) is fulfilled, and examine whether conditions (2) and (3) are fulfilled. If either fails, the computer passes on. Very often it will require some examination to find whether $H - \lambda$ or $T - \lambda$ falls within the limits; in these cases, the computer may mark the occultation for trial and leave the decision for the subsequent operations. The whole list can be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

Phenomena of Planets and Satellites, pages 450—483.—These are, for the most part, sufficiently explained in the body of the work. The following additional explanations are added for completeness.

Disks of Mercury and Venus, pages 450—451.—The angle θ, needed in reducing meridian observations, is the angle which the arc of great circle from the planet to the sun makes with the arc from the planet toward the west, reckoned in the direction west, north, east, south. This position-angle is reckoned from 0° to 360°, as in the measurement of double stars, the planet taking the place of the central star. But its measure is 90° greater than that of a double star.

We may also regard θ as expressing the angle which the line of cusps makes with the meridian, the positive direction of the meridian being toward the north, and the positive direction of the line of cusps that in which a person following this line would have the centre of the planet upon his right.

Satellites and Disk of Mars, page 452.—This page gives the Washington mean times of eastern and western elongations, the position angles and distances of the satellites for the twenty days preceding and following opposition.

Satellites of Jupiter, pages 453—477.—The times of phenomena are explained at the foot of each page; the diagrams on page 453.

Phenomena, pages 484 and 485.—The conjunctions, quadratures, and oppositions of the planets with respect to the sun give the hours when the longitude of each planet differs from that of the sun by 0°, 90°, or 180°.

The conjunctions of the moon and planets with each other are given in right ascension. The degrees and minutes to the right show the difference of declination at the moment of conjunction.

Latitude by Observed Altitude of Polaris.—Table IV replaces the Tables A, B, C, D, given as a *Supplement* to the volumes of the Ephemeris for 1874—1881, and is intended for use at sea and reconnaissance on land. It will furnish an approximate value of the latitude, the probable error of which, in so far as the table is concerned, will be a few tenths of a minute of arc.

The directions for using the table are adapted to a right ascension of Polaris equal to $1^h\ 17^m.4$. Somewhat greater accuracy may be insured by substituting the right ascension of Polaris at the date of observation, from pages 302—313 of this volume.

APPENDIX.

ON THE CONSTRUCTION OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC FOR 1886.

The adopted constants of precession, nutation, and aberration are those of **Struve** and **Peters**, namely:—

$$\begin{aligned}\text{Precession} &= 50''.2411 + 0''.0002268\, t\\ \text{Nutation} &= 9''.2231 + 0''.000009\, t\\ \text{Aberration} &= 20''.4451\end{aligned}$$

in which t is the number of years after 1800.0.

The obliquity of the ecliptic is that of **Hansen**'s *Tables du Soleil*, which is 0".32 greater than that of **Peters**, given in the issues of this Ephemeris preceding that for 1882. A comparison of **Hansen**'s mean obliquity with that of **Peters** and of **Le Verrier** at different epochs is given in the following table:—

Epoch.	Hansen.	Peters.	Le Verrier.	H.—P.	H.—L.
	° ′ ″	″	″	″	″
1750	23 28 18.19	17.44	19.42	+0.75	−1.23
1800	23 27 54.80	54.22	55.63	+0.58	−0.83
1850	23 27 31.42	30.99	31.83	+0.43	−0.41
1900	23 27 8.02	7.76	8.03	+0.26	−0.01

The formulæ for reducing the places of the fixed stars, page 280, correspond to the *Star Tables of the American Ephemeris*, Washington, 1869.

The mean right ascensions of stars have been reduced to **Newcomb**'s fundamental standard, in the catalogue attached to the *Washington Observations for* 1870, Appendix II, with the following exceptions: The right ascensions of the 48 circumpolar stars north of 60° north declination are from Dr. **Gould**'s *Standard Places of Fundamental Stars*, second edition, United States Coast Survey Office, 1866. Of the twelve stars south of 50° south declination, the positions of β Hydri, α Trianguli Australis, and σ Octantis, have been corrected from data furnished by Dr. **Gould**; while the remaining nine are, as before, from the *British Nautical Almanac* for 1848.

The right ascensions of additional stars in the general list, for which no apparent places are given in the subsequent section, have been taken partly from the *Catalogue of* 1098 *Standard Clock and Zodiacal Stars*, forming Part IV of Vol. I of *Astronomical Papers Prepared for the Use of the American Ephemeris and Nautical Almanac*, Washington, 1881; and partly from the catalogue of the Astronomische Gesellschaft of 1878. A few have been derived from recent catalogues without a rigorous reduction for equinox.

The mean declinations of stars are taken from Boss's paper in the *Report of the Northern Boundary Commission*, Washington, 1879, for all stars found therein. The declinations of all the other stars have been reduced to the same standard, except those of the additional ones above, which have been taken partly from the Astronomische Gesellschaft list, and partly from places in recent catalogues. To the apparent places of Sirius and Procyon have been applied the periodic corrections resulting from **Auwers**'s investigations.

The values of these corrections are:—

Year.	Sirius.		Procyon.	
1886.0	$\Delta\alpha = +\overset{s}{0}.019$	$\Delta\delta = -\overset{\prime\prime}{1}.25$	$\Delta\alpha = +\overset{s}{0}.005$	$\Delta\delta = +\overset{\prime\prime}{1}.05$
1887.0	$\Delta\alpha = +0.040$	$\Delta\delta = -1.13$	$\Delta\alpha = +0.015$	$\Delta\delta = +1.02$

The ephemeris of the sun is constructed from **Hansen** *and* **Olufsen's** *Tables du Soleil*, Copenhagen, 1853, except that **Struve's** aberration has been used. This is equivalent to adding 0″.19 to the true longitudes, but it does not affect the right ascensions and declinations. The sun's rectangular equatorial co-ordinates have been computed from the longitudes and latitudes by the following formulæ:—

$$\begin{aligned}
X &= R \cos \lambda \\
Y &= R \sin \lambda \cos \omega - 19.3\, R\, \beta \\
Z &= R \sin \lambda \sin \omega + 44.5\, R\, \beta
\end{aligned}$$

The reductions to mean equinox, 1885.0, are computed by the formulæ,

$$\begin{aligned}
\Delta X' &= + Y \sec \omega\, \Delta \lambda \\
\Delta Y' &= - X \cos \omega\, \Delta \lambda + \Delta \omega - 9.4\, \tau\, R \sin (\odot + 187^\circ) \\
\Delta Z' &= - X \sin \omega\, \Delta \lambda - Y \Delta \omega + 21.7\, \tau\, R \sin (\odot + 187^\circ)
\end{aligned}$$

Wherein—

λ and β are the longitude and latitude of the sun referred to the equinox and ecliptic of the date;
ω, the obliquity of the ecliptic;
$\Delta \lambda$, the reduction of longitude for precession and nutation from January 0;
$\Delta \omega$, the reduction of the mean to the apparent obliquity;
τ, the fraction of the year since January 0.

The numerical coefficients are in units of the seventh place of decimals. The correction for latitude has been taken from **Goetze's** paper in the *Astronomical Journal*, Vol. II, page 71.

The mean equatorial horizontal parallax of the sun, adopted from Professor **Newcomb's** *Investigation of the Distance of the Sun and the Elements which depend on it*,* is 8″.848. The adopted semidiameter of the sun at the earth's mean distance is 16′ 2″. In the computations pertaining to eclipses, **Bessel's** semidiameter, 15′ 59″.788 has been used.

The right ascension, declination, and parallax of the moon are derived from **Hansen's** *Tables de la Lune*, London, 1857, the mean longitude being corrected in accordance with **Newcomb's** *Researches on the Motion of the Moon*, Part I, page 268,† and a corrected table being substituted for Table XXXIV.

The semidiameter of the moon is computed from the moon's horizontal parallax by the formula,

$$S = 0.272274\, \pi + 2''.5$$

The constant 2″.5 is omitted in the computation of eclipses and occultations, as due entirely to telescopic and ocular irradiation.

The ephemeris of Mercury is derived from Professor **Winlock's** *Tables of Mercury*, Washington, 1864. They are based on the older theory of **Le Verrier**, published in the Additions to the *Connaissance des Temps* for 1848.

The ephemeris of Venus is derived from Mr. G. W. **Hill's** *Tables of Venus*, Washington, 1872.

The ephemeris of Mars is derived from manuscript tables constructed from **Lindenau's** Tables. Mr. **Hugh Breen's** results, contained in his paper *On the Corrections of* **Lindenau's** *Elements of Mars*, published in the *Memoirs of the Royal Astronomical Society*, Vol. XX, have also been discussed and applied; and **Le Verrier's** secular variations of the elements are likewise adopted. The perturbations produced by Jupiter have been increased by $\frac{1}{80}$ of their value. The following are the corresponding corrected elements and annual variations for Washington, 1855.0:—

$$\begin{aligned}
L &= 320^\circ\ 13'\ 33''.87 + 689101''.1527\ t \\
\pi &= 333\ 23\ 17.84 + 65.9990\ t \\
\Omega &= 48\ 25\ 55.29 + 27.6997\ t \\
i &= 1\ 51\ 2.20 - 0.02141\ t \\
e &= 19238''.75 + 0.18549\ t \\
n &= 689050''.8927 \\
a &= 1.5236915
\end{aligned}$$

The ephemeris of Jupiter is derived from manuscript tables constructed from **Bouvard's** Tables, with such changes as were required to make them correspond more nearly to the formulæ.

The ephemeris of Saturn is derived from a provisional theory constructed by Mr. **George W. Hill**, and still unpublished.

The ephemerides of Uranus and Neptune are derived from Professor **Newcomb's** Tables, published by the *Smithsonian Institution*.

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* *Astronomical Observations made at the U. S. Naval Observatory, Washington*, 1865, Appendix II.

† *Astronomical Observations made at the U. S. Naval Observatory, Washington*, 1875, Appendix II.

The semidiameters of the planets are computed from the following values:—

	Semidiameter.	Log Dist.	Authority.
Mercury	3″.34	0.00	Le Verrier, *Theory of Mercury.*
Venus	8.546 ± 0.086	0.00	Peirce, from the Washington Observations of 1845 and 1846, made with the Mural Circle.
Mars (polar)	2.842 ± 0.057	0.25	
Jupiter (polar)	18.78 ± 0.067	0.70	
Saturn (polar)	8.77 ± 0.039	0.95	
Uranus	1.68 ± 0.3	1.30	
Neptune	1.28	1.48	
Jupiter (equatorial)	20.00	0.70	
Saturn (equatorial)	9.38	0.95	

The elements of eclipses of the sun and occultations of stars by the moon are adapted to Bessel's method, using the special forms in Chauvenet's *Spherical and Practical Astronomy.* The adopted semidiameters are:—

Semidiameter of the sun at distance unity. . . .	959″.788
Ratio of radius of moon to radius of earth . . .	0.27227

The eclipses of Jupiter's satellites are computed from Todd's *Continuation of* Damoiseau's *Tables,* Washington, 1876. The occultations, transits, etc., are computed from Woolhouse's Tables, *British Nautical Almanac* for 1835, Table II of each satellite having been adapted to Damoiseau's Tables.

The elongations and conjunctions of the satellites of Saturn are computed from manuscript tables by Professor Newcomb.

The apparent elements of the rings of Saturn are computed from Bessel's data, except those for the dusky ring.

The elongations of the satellites of Uranus, and of the satellite of Neptune are prepared from the data of Professor Newcomb's *Uranian and Neptunian Systems,* Washington, 1875.

In compiling the positions of observatories, the latest available data have been used. The positions have been furnished, in many instances, through the courtesy of the directors of the Observatories, in response to a circular issued by the Superintendent of the American Ephemeris.

The reduction to geocentric latitude, and the logarithm of the radius of the earth are derived from Bessel's elements of the terrestrial spheroid, as adapted in Table III of Chauvenet's *Spherical and Practical Astronomy,* Vol. II:—

$$\log e = 8.9122052$$
$$\varphi' - \varphi = -11' 30''.65 \sin 2\varphi + 1''.16 \sin 4\varphi$$
$$\log \rho = 9.9992747 + 0.0007271 \cos 2\varphi - 0.0000018 \cos 4\varphi$$

Table IV, for finding the latitude from an observed altitude of Polaris, is constructed for—

(1) An altitude of Polaris equal to 45°.

(2) A declination of Polaris equal to + 88° 41′ 40″.

The principal computations of the Ephemeris have been distributed in the following manner:—

The sun has been computed by Mr. Eastwood; the moon's longitude, latitude, semidiameter and horizontal parallax, by Professor Keith; right ascension and declination, by Professor Van Vleck; culminations, by Professor Runkle; lunar distances, by Mr. W. B. Oliver; Mercury and Venus, by Mr. E. P. Austin; Mars, Jupiter, Saturn, Uranus, and Neptune, by Mr. Roberdeau Buchanan; Jupiter's satellites, by Mr. W. F. McK. Ritter. The fixed stars have been prepared by Mr. Wiessner and Mr. Prentiss; the general constants for their reduction, by Mr. Wiessner; the occultations, by Mr. Downes assisted by Mr. J. O. Wiessner; and the eclipses have been computed and the charts projected by Mr. Buchanan.

TABLE I.

CORRECTION REQUIRED, ON ACCOUNT OF SECOND DIFFERENCES OF THE MOON'S MOTION, IN FINDING THE GREENWICH TIME CORRESPONDING TO A CORRECTED LUNAR DISTANCE.

Difference of the Proportional Logarithms in the Ephemeris.

Approximate Interval.		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
0 20	2 40	0	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
0 30	2 30	0	1	1	2	2	2	2	3	3	3	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9
0 40	2 20	0	1	1	2	2	3	3	3	4	4	5	5	6	6	6	7	7	8	8	9	9	10	10	10	11	11
0 50	2 10	1	1	2	2	3	3	4	4	5	5	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13
1 0	2 0	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13	14	14
1 10	1 50	1	1	2	2	3	4	4	5	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	15
1 20	1 40	1	1	2	3	3	4	4	5	6	6	7	7	8	9	9	10	10	11	12	12	13	14	14	15	15	16
1 30	1 30	1	1	2	3	3	4	4	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16

Difference of the Proportional Logarithms in the Ephemeris.

		54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	7
0 20	2 40	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12
0 30	2 30	9	10	10	10	11	11	12	12	12	13	13	13	14	14	14	14	15	15	16	16	16	17	17	17
0 40	2 20	12	12	13	13	13	14	14	15	15	16	16	16	17	17	18	18	19	19	19	20	20	21	21	22
0 50	2 10	14	14	15	15	16	16	16	17	17	18	19	19	20	20	21	21	22	22	22	23	23	24	24	25
1 0	2 0	15	16	16	17	17	18	18	19	19	20	21	21	22	22	23	23	24	24	25	25	26	27	27	28
1 10	1 50	16	17	17	18	18	19	19	20	21	21	22	22	23	24	24	25	25	26	27	27	28	28	29	30
1 20	1 40	17	17	18	19	19	20	20	21	21	22	23	23	24	25	25	26	26	27	28	28	29	29	30	31
1 30	1 30	17	18	18	19	19	20	21	21	22	23	23	24	24	25	25	26	27	27	28	29	29	30	31	31

Difference of the Proportional Logarithms in the Ephemeris.

		102	104	106	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	9	9	9	9
0 20	2 40	13	13	13	13	14	14	14	14	15	15	15	15	15	16	16	16	16	17	17
0 30	2 30	18	18	18	19	19	19	20	20	20	21	21	21	22	22	22	23	23	24	24
0 40	2 20	22	22	23	23	24	24	25	25	25	26	26	27	27	28	28	28	29	29	30
0 50	2 10	26	26	26	27	27	28	29	29	29	30	30	31	31	32	32	33	33	34	34
1 0	2 0	28	29	29	30	30	31	31	32	33	33	34	34	35	35	36	37	37	38	38
1 10	1 50	30	31	31	32	32	33	34	34	35	35	36	37	37	38	38	39	40	40	41
1 20	1 40	31	32	33	33	34	34	35	35	36	37	38	38	39	39	40	41	41	42	42
1 30	1 30	32	32	33	34	34	35	35	36	36	37	38	39	39	40	40	41	42	42	43

The correction is to be added to the approximate Greenwich time when the proportional logarithms in the Ephemeris are decreasing, and subtracted when they are increasing.

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	$0^{\mathrm{h.}}$		$1^{\mathrm{h.}}$		$2^{\mathrm{h.}}$		$3^{\mathrm{h.}}$		$4^{\mathrm{h.}}$		$5^{\mathrm{h.}}$		$6^{\mathrm{h.}}$		$7^{\mathrm{h.}}$		For Seconds.	
m	m	s	m	s	m	s	m	s	m	s	m	s	m	s	m	s	s	s
0	0	0.000	0	9.830	0	19.659	0	29.489	0	39.318	0	49.148	0	58.977	1	8.807	0	0.000
1	0	0.164	0	9.993	0	19.823	0	29.653	0	39.482	0	49.312	0	59.141	1	8.971	1	0.003
2	0	0.328	0	10.157	0	19.987	0	29.816	0	39.646	0	49.475	0	59.305	1	9.135	2	0.005
3	0	0.491	0	10.321	0	20.151	0	29.980	0	39.810	0	49.639	0	59.469	1	9.298	3	0.008
4	0	0.655	0	10.485	0	20.314	0	30.144	0	39.974	0	49.803	0	59.633	1	9.462	4	0.011
5	0	0.819	0	10.649	0	20.478	0	30.308	0	40.137	0	49.967	0	59.796	1	9.626	5	0.014
6	0	0.983	0	10.813	0	20.642	0	30.472	0	40.301	0	50.131	0	59.960	1	9.790	6	0.016
7	0	1.147	0	10.976	0	20.806	0	30.635	0	40.465	0	50.295	1	0.124	1	9.954	7	0.019
8	0	1.311	0	11.140	0	20.970	0	30.799	0	40.629	0	50.458	1	0.288	1	10.118	8	0.022
9	0	1.474	0	11.304	0	21.134	0	30.963	0	40.793	0	50.622	1	0.452	1	10.281	9	0.025
10	0	1.638	0	11.468	0	21.297	0	31.127	0	40.956	0	50.786	1	0.616	1	10.445	10	0.027
11	0	1.802	0	11.632	0	21.461	0	31.291	0	41.120	0	50.950	1	0.779	1	10.609	11	0.030
12	0	1.966	0	11.795	0	21.625	0	31.455	0	41.284	0	51.114	1	0.943	1	10.773	12	0.033
13	0	2.130	0	11.959	0	21.789	0	31.618	0	41.448	0	51.278	1	1.107	1	10.937	13	0.035
14	0	2.294	0	12.123	0	21.953	0	31.782	0	41.612	0	51.441	1	1.271	1	11.100	14	0.038
15	0	2.457	0	12.287	0	22.117	0	31.946	0	41.776	0	51.605	1	1.435	1	11.264	15	0.041
16	0	2.621	0	12.451	0	22.280	0	32.110	0	41.939	0	51.769	1	1.599	1	11.428	16	0.044
17	0	2.785	0	12.615	0	22.444	0	32.274	0	42.103	0	51.933	1	1.762	1	11.592	17	0.046
18	0	2.949	0	12.778	0	22.608	0	32.438	0	42.267	0	52.097	1	1.926	1	11.756	18	0.049
19	0	3.113	0	12.942	0	22.772	0	32.601	0	42.431	0	52.260	1	2.090	1	11.920	19	0.052
20	0	3.277	0	13.106	0	22.936	0	32.765	0	42.595	0	52.424	1	2.254	1	12.083	20	0.055
21	0	3.440	0	13.270	0	23.099	0	32.929	0	42.759	0	52.588	1	2.418	1	12.247	21	0.057
22	0	3.604	0	13.434	0	23.263	0	33.093	0	42.922	0	52.752	1	2.582	1	12.411	22	0.060
23	0	3.768	0	13.598	0	23.427	0	33.257	0	43.086	0	52.916	1	2.745	1	12.575	23	0.063
24	0	3.932	0	13.761	0	23.591	0	33.420	0	43.250	0	53.080	1	2.909	1	12.739	24	0.066
25	0	4.096	0	13.925	0	23.755	0	33.584	0	43.414	0	53.243	1	3.073	1	12.903	25	0.068
26	0	4.259	0	14.089	0	23.919	0	33.748	0	43.578	0	53.407	1	3.237	1	13.066	26	0.071
27	0	4.423	0	14.253	0	24.082	0	33.912	0	43.742	0	53.571	1	3.401	1	13.230	27	0.074
28	0	4.587	0	14.417	0	24.246	0	34.076	0	43.905	0	53.735	1	3.564	1	13.394	28	0.076
29	0	4.751	0	14.581	0	24.410	0	34.240	0	44.069	0	53.899	1	3.728	1	13.558	29	0.079
30	0	4.915	0	14.744	0	24.574	0	34.403	0	44.233	0	54.063	1	3.892	1	13.722	30	0.082
31	0	5.079	0	14.908	0	24.738	0	34.567	0	44.397	0	54.226	1	4.056	1	13.886	31	0.085
32	0	5.242	0	15.072	0	24.902	0	34.731	0	44.561	0	54.390	1	4.220	1	14.049	32	0.087
33	0	5.406	0	15.236	0	25.065	0	34.895	0	44.724	0	54.554	1	4.384	1	14.213	33	0.090
34	0	5.570	0	15.400	0	25.229	0	35.059	0	44.888	0	54.718	1	4.547	1	14.377	34	0.093
35	0	5.734	0	15.563	0	25.393	0	35.223	0	45.052	0	54.882	1	4.711	1	14.541	35	0.096
36	0	5.898	0	15.727	0	25.557	0	35.386	0	45.216	0	55.046	1	4.875	1	14.705	36	0.098
37	0	6.062	0	15.891	0	25.721	0	35.550	0	45.380	0	55.209	1	5.039	1	14.868	37	0.101
38	0	6.225	0	16.055	0	25.885	0	35.714	0	45.544	0	55.373	1	5.203	1	15.032	38	0.104
39	0	6.389	0	16.219	0	26.048	0	35.878	0	45.707	0	55.537	1	5.367	1	15.196	39	0.106
40	0	6.553	0	16.383	0	26.212	0	36.042	0	45.871	0	55.701	1	5.530	1	15.360	40	0.109
41	0	6.717	0	16.546	0	26.376	0	36.206	0	46.035	0	55.865	1	5.694	1	15.524	41	0.112
42	0	6.881	0	16.710	0	26.540	0	36.369	0	46.199	0	56.028	1	5.858	1	15.688	42	0.115
43	0	7.045	0	16.874	0	26.704	0	36.533	0	46.363	0	56.192	1	6.022	1	15.851	43	0.117
44	0	7.208	0	17.038	0	26.867	0	36.697	0	46.527	0	56.356	1	6.186	1	16.015	44	0.120
45	0	7.372	0	17.202	0	27.031	0	36.861	0	46.690	0	56.520	1	6.350	1	16.179	45	0.123
46	0	7.536	0	17.366	0	27.195	0	37.025	0	46.854	0	56.684	1	6.513	1	16.343	46	0.126
47	0	7.700	0	17.529	0	27.359	0	37.188	0	47.018	0	56.848	1	6.677	1	16.507	47	0.128
48	0	7.864	0	17.693	0	27.523	0	37.352	0	47.182	0	57.011	1	6.841	1	16.671	48	0.131
49	0	8.027	0	17.857	0	27.687	0	37.516	0	47.346	0	57.175	1	7.005	1	16.834	49	0.134
50	0	8.191	0	18.021	0	27.850	0	37.680	0	47.510	0	57.339	1	7.169	1	16.998	50	0.137
51	0	8.355	0	18.185	0	28.014	0	37.844	0	47.673	0	57.503	1	7.332	1	17.162	51	0.139
52	0	8.519	0	18.349	0	28.178	0	38.008	0	47.837	0	57.667	1	7.496	1	17.326	52	0.142
53	0	8.683	0	18.512	0	28.342	0	38.171	0	48.001	0	57.831	1	7.660	1	17.490	53	0.145
54	0	8.847	0	18.676	0	28.506	0	38.335	0	48.165	0	57.994	1	7.824	1	17.654	54	0.147
55	0	9.010	0	18.840	0	28.670	0	38.499	0	48.329	0	58.158	1	7.988	1	17.817	55	0.150
56	0	9.174	0	19.004	0	28.833	0	38.663	0	48.492	0	58.322	1	8.152	1	17.981	56	0.153
57	0	9.338	0	19.168	0	28.997	0	38.827	0	48.656	0	58.486	1	8.315	1	18.145	57	0.156
58	0	9.502	0	19.331	0	29.161	0	38.991	0	48.820	0	58.650	1	8.479	1	18.309	58	0.158
59	0	9.666	0	19.495	0	29.325	0	39.154	0	48.984	0	58.814	1	8.643	1	18.473	59	0.161
Sidereal.	$0^{\mathrm{h.}}$		$1^{\mathrm{h.}}$		$2^{\mathrm{h.}}$		$3^{\mathrm{h.}}$		$4^{\mathrm{h.}}$		$5^{\mathrm{h.}}$		$6^{\mathrm{h.}}$		$7^{\mathrm{h.}}$		For Seconds.	

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	$8^{h.}$	$9^{h.}$	$10^{h.}$	$11^{h.}$	$12^{h.}$	$13^{h.}$	$14^{h.}$	$15^{h.}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 7.784	2 17.614	2 27.443	0	0.000
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 7.948	2 17.778	2 27.607	1	0.003
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 8.112	2 17.941	2 27.771	2	0.005
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 8.276	2 18.105	2 27.935	3	0.008
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 8.440	2 18.269	2 28.099	4	0.011
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 8.603	2 18.433	2 28.263	5	0.014
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 8.767	2 18.597	2 28.426	6	0.016
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 8.931	2 18.761	2 28.590	7	0.019
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 9.095	2 18.924	2 28.754	8	0.022
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 9.259	2 19.088	2 28.918	9	0.025
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 9.423	2 19.252	2 29.082	10	0.027
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 9.586	2 19.416	2 29.245	11	0.030
12	1 20.602	1 30.432	1 40.261	1 50.091	1 59.921	2 9.750	2 19.580	2 29.409	12	0.033
13	1 20.766	1 30.596	1 40.425	1 50.255	2 0.084	2 9.914	2 19.744	2 29.573	13	0.035
14	1 20.930	1 30.760	1 40.589	1 50.419	2 0.248	2 10.078	2 19.907	2 29.737	14	0.038
15	1 21.094	1 30.923	1 40.753	1 50.583	2 0.412	2 10.242	2 20.071	2 29.901	15	0.041
16	1 21.258	1 31.087	1 40.917	1 50.746	2 0.576	2 10.405	2 20.235	2 30.065	16	0.044
17	1 21.422	1 31.251	1 41.081	1 50.910	2 0.740	2 10.569	2 20.399	2 30.228	17	0.046
18	1 21.585	1 31.415	1 41.244	1 51.074	2 0.904	2 10.733	2 20.563	2 30.392	18	0.049
19	1 21.749	1 31.579	1 41.408	1 51.238	2 1.067	2 10.897	2 20.727	2 30.556	19	0.052
20	1 21.913	1 31.743	1 41.572	1 51.402	2 1.231	2 11.061	2 20.890	2 30.720	20	0.055
21	1 22.077	1 31.906	1 41.736	1 51.565	2 1.395	2 11.225	2 21.054	2 30.884	21	0.057
22	1 22.241	1 32.070	1 41.900	1 51.729	2 1.559	2 11.388	2 21.218	2 31.048	22	0.060
23	1 22.404	1 32.234	1 42.064	1 51.893	2 1.723	2 11.552	2 21.382	2 31.211	23	0.063
24	1 22.568	1 32.398	1 42.227	1 52.057	2 1.887	2 11.716	2 21.546	2 31.375	24	0.066
25	1 22.732	1 32.562	1 42.391	1 52.221	2 2.050	2 11.880	2 21.709	2 31.539	25	0.068
26	1 22.896	1 32.726	1 42.555	1 52.385	2 2.214	2 12.044	2 21.873	2 31.703	26	0.071
27	1 23.060	1 32.889	1 42.719	1 52.548	2 2.378	2 12.208	2 22.037	2 31.867	27	0.074
28	1 23.224	1 33.053	1 42.883	1 52.712	2 2.542	2 12.371	2 22.201	2 32.031	28	0.076
29	1 23.387	1 33.217	1 43.047	1 52.876	2 2.706	2 12.535	2 22.365	2 32.194	29	0.079
30	1 23.551	1 33.381	1 43.210	1 53.040	2 2.869	2 12.699	2 22.529	2 32.358	30	0.082
31	1 23.715	1 33.545	1 43.374	1 53.204	2 3.033	2 12.863	2 22.692	2 32.522	31	0.085
32	1 23.879	1 33.708	1 43.538	1 53.368	2 3.197	2 13.027	2 22.856	2 32.686	32	0.087
33	1 24.043	1 33.872	1 43.702	1 53.531	2 3.361	2 13.191	2 23.020	2 32.850	33	0.090
34	1 24.207	1 34.036	1 43.866	1 53.695	2 3.525	2 13.354	2 23.184	2 33.013	34	0.093
35	1 24.370	1 34.200	1 44.029	1 53.859	2 3.689	2 13.518	2 23.348	2 33.177	35	0.096
36	1 24.534	1 34.364	1 44.193	1 54.023	2 3.852	2 13.682	2 23.512	2 33.341	36	0.098
37	1 24.698	1 34.528	1 44.357	1 54.187	2 4.016	2 13.846	2 23.675	2 33.505	37	0.101
38	1 24.862	1 34.691	1 44.521	1 54.351	2 4.180	2 14.010	2 23.839	2 33.669	38	0.104
39	1 25.026	1 34.855	1 44.685	1 54.514	2 4.344	2 14.173	2 24.003	2 33.833	39	0.106
40	1 25.190	1 35.019	1 44.849	1 54.678	2 4.508	2 14.337	2 24.167	2 33.996	40	0.109
41	1 25.353	1 35.183	1 45.012	1 54.842	2 4.672	2 14.501	2 24.331	2 34.160	41	0.112
42	1 25.517	1 35.347	1 45.176	1 55.006	2 4.835	2 14.665	2 24.495	2 34.324	42	0.115
43	1 25.681	1 35.511	1 45.340	1 55.170	2 4.999	2 14.829	2 24.658	2 34.488	43	0.117
44	1 25.845	1 35.674	1 45.504	1 55.333	2 5.163	2 14.993	2 24.822	2 34.652	44	0.120
45	1 26.009	1 35.838	1 45.668	1 55.497	2 5.327	2 15.156	2 24.986	2 34.816	45	0.123
46	1 26.172	1 36.002	1 45.832	1 55.661	2 5.491	2 15.320	2 25.150	2 34.979	46	0.126
47	1 26.336	1 36.166	1 45.995	1 55.825	2 5.655	2 15.484	2 25.314	2 35.143	47	0.128
48	1 26.500	1 36.330	1 46.159	1 55.989	2 5.818	2 15.648	2 25.477	2 35.307	48	0.131
49	1 26.664	1 36.493	1 46.323	1 56.153	2 5.982	2 15.812	2 25.641	2 35.471	49	0.134
50	1 26.828	1 36.657	1 46.487	1 56.316	2 6.146	2 15.976	2 25.805	2 35.635	50	0.137
51	1 26.992	1 36.821	1 46.651	1 56.480	2 6.310	2 16.139	2 25.969	2 35.798	51	0.139
52	1 27.155	1 36.985	1 46.815	1 56.644	2 6.474	2 16.303	2 26.133	2 35.962	52	0.142
53	1 27.319	1 37.149	1 46.978	1 56.808	2 6.637	2 16.467	2 26.297	2 36.126	53	0.145
54	1 27.483	1 37.313	1 47.142	1 56.972	2 6.801	2 16.631	2 26.460	2 36.290	54	0.147
55	1 27.647	1 37.476	1 47.306	1 57.136	2 6.965	2 16.795	2 26.624	2 36.454	55	0.150
56	1 27.811	1 37.640	1 47.470	1 57.299	2 7.129	2 16.959	2 26.788	2 36.618	56	0.153
57	1 27.975	1 37.804	1 47.634	1 57.463	2 7.293	2 17.122	2 26.952	2 36.781	57	0.156
58	1 28.138	1 37.968	1 47.797	1 57.627	2 7.457	2 17.286	2 27.116	2 36.945	58	0.158
59	1 28.302	1 38.132	1 47.961	1 57.791	2 7.620	2 17.450	2 27.280	2 37.109	59	0.161
Sidereal.	$8^{h.}$	$9^{h.}$	$10^{h.}$	$11^{h.}$	$12^{h.}$	$13^{h.}$	$14^{h.}$	$15^{h.}$	For Seconds.	

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Side-real.	$16^{\mathrm{h.}}$	$17^{\mathrm{h.}}$	$18^{\mathrm{h.}}$	$19^{\mathrm{h.}}$	$20^{\mathrm{h.}}$	$21^{\mathrm{h.}}$	$22^{\mathrm{h.}}$	$23^{\mathrm{h.}}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	0	0.000
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1	0.003
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2	0.005
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3	0.008
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4	0.011
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5	0.014
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6	0.016
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7	0.019
8	2 38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	8	0.022
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9	0.025
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10	0.027
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11	0.030
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12	0.033
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13	0.035
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14	0.038
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15	0.041
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16	0.044
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17	0.046
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18	0.049
19	2 40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19	0.052
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20	0.055
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21	0.057
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22	0.060
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23	0.063
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24	0.066
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25	0.068
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26	0.071
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27	0.074
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28	0.076
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29	0.079
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30	0.082
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	31	0.085
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32	0.087
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33	0.090
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34	0.093
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35	0.096
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36	0.098
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37	0.101
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38	0.104
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39	0.106
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40	0.109
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41	0.112
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42	0.115
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43	0.117
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44	0.120
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45	0.123
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46	0.126
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47	0.128
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	48	0.131
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49	0.134
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50	0.137
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	51	0.139
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52	0.142
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53	0.145
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54	0.147
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55	0.150
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56	0.153
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57	0.156
58	2 46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58	0.158
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59	0.161
Side-real.	$16^{\mathrm{h.}}$	$17^{\mathrm{h.}}$	$18^{\mathrm{h.}}$	$19^{\mathrm{h.}}$	$20^{\mathrm{h.}}$	$21^{\mathrm{h.}}$	$22^{\mathrm{h.}}$	$23^{\mathrm{h.}}$	For Seconds.	

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	$0^{h.}$	$1^{h.}$	$2^{h.}$	$3^{h.}$	$4^{h.}$	$5^{h.}$	$6^{h.}$	$7^{h.}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.856	0 19.713	0 29.569	0 39.426	0 49.282	0 59.139	1 8.995	0	0.000
1	0 0.164	0 10.021	0 19.877	0 29.734	0 39.590	0 49.447	0 59.303	1 9.160	1	0.003
2	0 0.329	0 10.185	0 20.041	0 29.898	0 39.754	0 49.611	0 59.467	1 9.324	2	0.005
3	0 0.493	0 10.349	0 20.206	0 30.062	0 39.919	0 49.775	0 59.632	1 9.488	3	0.008
4	0 0.657	0 10.514	0 20.370	0 30.227	0 40.083	0 49.939	0 59.796	1 9.652	4	0.011
5	0 0.821	0·10.678	0 20.534	0 30.391	0 40.247	0 50.104	0 59.960	1 9.817	5	0.014
6	0 0.986	0 10.842	0 20.699	0 30.555	0 40.412	0 50.268	1 0.124	1 9.981	6	0.016
7	0 1.150	0 11.006	0 20.863	0 30.719	0 40.576	0 50.432	1 0.289	1 10.145	7	0.019
8	0 1.314	0 11.171	0 21.027	0 30.884	0 40.740	0 50.597	1 0.453	1 10.310	8	0.022
9	0 1.478	0 11.335	0 21.191	0 31.048	0 40.904	0 50.761	1 0.617	1 10.474	9	0.025
10	0 1.643	0 11.499	0 21.356	0 31.212	0 41.069	0 50.925	1 0.782	1 10.638	10	0.027
11	0 1.807	0 11.663	0 21.520	0 31.376	0 41.233	0 51.089	1 0.946	1 10.802	11	0.030
12	0 1.971	0 11.828	0 21.684	0 31.541	0 41.397	0 51.254	1 1.110	1 10.967	12	0.033
13	0 2.136	0 11.992	0 21.849	0 31.705	0 41.561	0 51.418	1 1.274	1 11.131	13	0.036
14	0 2.300	0 12.156	0 22.013	0 31.869	0 41.726	0 51.582	1 1.439	1 11.295	14	0.038
15	0 2.464	0 12.321	0 22.177	0 32.034	0 41.890	0 51.746	1 1.603	1 11.459	15	0.041
16	0 2.628	0 12.485	0 22.341	0 32.198	0 42.054	0 51.911	1 1.767	1 11.624	16	0.044
17	0 2.793	0 12.649	0 22.506	0 32.362	0 42.219	0 52.075	1 1.932	1 11.788	17	0.047
18	0 2.957	0 12.813	0 22.670	0 32.526	0 42.383	0 52.239	1 2.096	1 11.952	18	0.049
19	0 3.121	0 12.978	0 22.834	0 32.691	0 42.547	0 52.404	1 2.260	1 12.117	19	0.052
20	0 3.285	0 13.142	0 22.998	0 32.855	0 42.711	0 52.568	1 2.424	1 12.281	20	0.055
21	0 3.450	0 13.306	0 23.163	0 33.019	0 42.876	0 52.732	1 2.589	1 12.445	21	0.057
22	0 3.614	0 13.471	0 23.327	0 33.183	0 43.040	0 52.896	1 2.753	1 12.609	22	0.060
23	0 3.778	0 13.635	0 23.491	0 33.348	0 43.204	0 53.061	1 2.917	1 12.774	23	0.063
24	0 3.943	0 13.799	0 23.656	0 33.512	0 43.368	0 53.225	1 3.081	1 12.938	24	0.066
25	0 4.107	0 13.963	0 23.820	0 33.676	0 43.533	0 53.389	1 3.246	1 13.102	25	0.068
26	0 4.271	0 14.128	0 23.984	0 33.841	0 43.697	0 53.554	1 3.410	1 13.266	26	0.071
27	0 4.435	0 14.292	0 24.148	0 34.005	0 43.861	0 53.718	1 3.574	1 13.431	27	0.074
28	0 4.600	0 14.456	0 24.313	0 34.169	0 44.026	0 53.882	1 3.739	1 13.595	28	0.077
29	0 4.764	0 14.620	0 24.477	0 34.333	0 44.190	0 54.046	1 3.903	1 13.759	29	0.079
30	0 4.928	0 14.785	0 24.641	0 34.498	0 44.354	0 54.211	1 4.067	1 13.924	30	0.082
31	0 5.093	0 14.949	0 24.805	0 34.662	0 44.518	0 54.375	1 4.231	1 14.088	31	0.085
32	0 5.257	0 15.113	0 24.970	0 34.826	0 44.683	0 54.539	1 4.396	1 14.252	32	0.088
33	0 5.421	0 15.278	0 25.134	0 34.990	0 44.847	0 54.703	1 4.560	1 14.416	33	0.090
34	0 5.585	0 15.442	0 25.298	0 35.155	0 45.011	0 54.868	1 4.724	1 14.581	34	0.093
35	0 5.750	0 15.606	0 25.463	0 35.319	0 45.176	0 55.032	1 4.888	1 14.745	35	0.096
36	0 5.914	0 15.770	0 25.627	0 35.483	0 45.340	0 55.196	1 5.053	1 14.909	36	0.099
37	0 6.078	0 15.935	0 25.791	0 35.648	0 45.504	0 55.361	1 5.217	1 15.073	37	0.101
38	0 6.242	0 16.099	0 25.955	0 35.812	0 45.668	0 55.525	1 5.381	1 15.238	38	0.104
39	0 6.407	0 16.263	0 26.120	0 35.976	0 45.833	0 55.689	1 5.546	1 15.402	39	0.107
40	0 6.571	0 16.427	0 26.284	0 36.140	0 45.997	0 55.853	1 5.710	1 15.566	40	0.110
41	0 6.735	0 16.592	0 26.448	0 36.305	0 46.161	0 56.018	1 5.874	1 15.731	41	0.112
42	0 6.900	0 16.756	0 26.612	0 36.469	0 46.325	0 56.182	1 6.038	1 15.895	42	0 115
43	0 7.064	0 16.920	0 26.777	0 36.633	0 46.490	0 56.346	1 6.203	1 16.059	43	0.118
44	0 7.228	0 17.085	0 26.941	0 36.798	0 46.654	0 56.510	1 6.367	1 16.223	44	0.120
45	0 7.392	0 17.249	0 27.105	0 36.962	0 46.818	0 56.675	1 6.531	1 16.388	45	0.123
46	0 7.557	0 17.413	0 27.270	0 37.126	0 46.983	0 56.839	1 6.695	1 16.552	46	0.126
47	0 7.721	0 17.577	0 27.434	0 37.290	0 47.147	0 57.003	1 6.860	1 16.716	47	0.129
48	0 7.885	0 17.742	0 27.598	0 37.455	0 47.311	0 57.168	1 7.024	1 16.881	48	0.131
49	0 8.049	0 17.906	0 27.762	0 37.619	0 47.475	0 57.332	1 7.188	1 17.045	49	0.134
50	0 8.214	0 18.070	0 27.927	0 37.783	0 47.640	0 57.496	1 7.353	1 17.209	50	0.137
51	0 8.378	0 18.234	0 28.091	0 37.947	0 47.804	0 57.660	1 7.517	1 17.373	51	0.140
52	0 8.542	0 18.399	0 28.255	0 38.112	0 47.968	0 57.825	1 7.681	1 17.538	52	0.142
53	0 8.707	0 18.563	0 28.420	0 38.276	0 48.132	0 57.989	1 7.845	1 17.702	53	0.145
54	0 8.871	0 18.727	0 28.584	0 38.440	0 48.297	0 58.153	1 8.010	1 17.866	54	0.148
55	0 9.035	0 18.892	0 28.748	0 38.605	0 48.461	0 58.317	1 8.174	1 18.030	55	0.151
56	0 9.199	0 19.056	0 28.912	0 38.769	0 48.625	0 58.482	1 8.338	1 18.195	56	0.153
57	0 9.364	0 19.220	0 29.077	0 38.933	0 48.790	0 58.646	1 8.502	1 18.359	57	0.156
58	0 9.528	0 19.384	0 29.241	0 39.097	0 48.954	0 58.810	1 8.667	1 18.523	58	0.159
59	0 9.692	0 19.549	0 29.405	0 39.262	0 49.118	0 58.975	1 8.831	1 18.688	59	0.162
Mean Solar.	$0^{h.}$	$1^{h.}$	$2^{h.}$	$3^{h.}$	$4^{h.}$	$5^{h.}$	$6^{h.}$	$7^{h.}$	For Seconds.	

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	$8^{\mathrm{h.}}$	$9^{\mathrm{h.}}$	$10^{\mathrm{h.}}$	$11^{\mathrm{h.}}$	$12^{\mathrm{h.}}$	$13^{\mathrm{h.}}$	$14^{\mathrm{h.}}$	$15^{\mathrm{h.}}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.852	1 28.708	1 38.565	1 48.421	1 58.278	2 8.134	2 17.991	2 27.847	0	0.000
1	1 19.016	1 28.873	1 38.729	1 48.585	1 58.442	2 8.298	2 18.155	2 28.011	1	0.003
2	1 19.180	1 29.037	1 38.893	1 48.750	1 58.606	2 8.463	2 18.319	2 28.176	2	0.005
3	1 19.345	1 29.201	1 39.058	1 48.914	1 58.771	2 8.627	2 18.483	2 28.340	3	0.008
4	1 19.509	1 29.365	1 39.222	1 49.078	1 58.935	2 8.791	2 18.648	2 28.504	4	0.011
5	1 19.673	1 29.530	1 39.386	1 49.243	1 59.099	2 8.956	2 18.812	2 28.668	5	0.014
6	1 19.837	1 29.694	1 39.550	1 49.407	1 59.263	2 9.120	2 18.976	2 28.833	6	0.016
7	1 20.002	1 29.858	1 39.715	1 49.571	1 59.428	2 9.284	2 19.141	2 28.997	7	0.019
8	1 20.166	1 30.022	1 39.879	1 49.735	1 59.592	2 9.448	2 19.305	2 29.161	8	0.022
9	1 20.330	1 30.187	1 40.043	1 49.900	1 59.756	2 9.613	2 19.469	2 29.326	9	0.025
10	1 20.495	1 30.351	1 40.207	1 50.064	1 59.920	2 9.777	2 19.633	2 29.490	10	0.027
11	1 20.659	1 30.515	1 40.372	1 50.228	2 0.085	2 9.941	2 19.798	2 29.654	11	0.030
12	1 20.823	1 30.680	1 40.536	1 50.393	2 0.249	2 10.105	2 19.962	2 29.818	12	0.033
13	1 20.987	1 30.844	1 40.700	1 50.557	2 0.413	2 10.270	2 20.126	2 29.983	13	0.036
14	1 21.152	1 31.008	1 40.865	1 50.721	2 0.578	2 10.434	2 20.290	2 30.147	14	0.038
15	1 21.316	1 31.172	1 41.029	1 50.885	2 0.742	2 10.598	2 20.455	2 30.311	15	0.041
16	1 21.480	1 31.337	1 41.193	1 51.050	2 0.906	2 10.763	2 20.619	2 30.476	16	0.044
17	1 21.644	1 31.501	1 41.357	1 51.214	2 1.070	2 10.927	2 20.783	2 30.640	17	0.047
18	1 21.809	1 31.665	1 41.522	1 51.378	2 1.235	2 11.091	2 20.948	2 30.804	18	0.049
19	1 21.973	1 31.829	1 41.686	1 51.542	2 1.399	2 11.255	2 21.112	2 30.968	19	0.052
20	1 22.137	1 31.994	1 41.850	1 51.707	2 1.563	2 11.420	2 21.276	2 31.133	20	0.055
21	1 22.302	1 32.158	1 42.015	1 51.871	2 1.727	2 11.584	2 21.440	2 31.297	21	0.057
22	1 22.466	1 32.322	1 42.179	1 52.035	2 1.892	2 11.748	2 21.605	2 31.461	22	0.060
23	1 22.630	1 32.487	1 42.343	1 52.200	2 2.056	2 11.912	2 21.769	2 31.625	23	0.063
24	1 22.794	1 32.651	1 42.507	1 52.364	2 2.220	2 12.077	2 21.933	2 31.790	24	0.066
25	1 22.959	1 32.815	1 42.672	1 52.528	2 2.385	2 12.241	2 22.098	2 31.954	25	0.068
26	1 23.123	1 32.979	1 42.836	1 52.692	2 2.549	2 12.405	2 22.262	2 32.118	26	0.071
27	1 23.287	1 33.144	1 43.000	1 52.857	2 2.713	2 12.570	2 22.426	2 32.283	27	0.074
28	1 23.451	1 33.308	1 43.164	1 53.021	2 2.877	2 12.734	2 22.590	2 32.447	28	0.077
29	1 23.616	1 33.472	1 43.329	1 53.185	2 3.042	2 12.898	2 22.755	2 32.611	29	0.079
30	1 23.780	1 33.637	1 43.493	1 53.349	2 3.206	2 13.062	2 22.919	2 32.775	30	0.082
31	1 23.944	1 33.801	1 43.657	1 53.514	2 3.370	2 13.227	2 23.083	2 32.940	31	0.085
32	1 24.109	1 33.965	1 43.822	1 53.678	2 3.534	2 13.391	2 23.247	2 33.104	32	0.088
33	1 24.273	1 34.129	1 43.986	1 53.842	2 3.699	2 13.555	2 23.412	2 33.268	33	0.090
34	1 24.437	1 34.294	1 44.150	1 54.007	2 3.863	2 13.720	2 23.576	2 33.432	34	0.093
35	1 24.601	1 34.458	1 44.314	1 54.171	2 4.027	2 13.884	2 23.740	2 33.597	35	0.096
36	1 24.766	1 34.622	1 44.479	1 54.335	2 4.192	2 14.048	2 23.905	2 33.761	36	0.099
37	1 24.930	1 34.786	1 44.643	1 54.499	2 4.356	2 14.212	2 24.069	2 33.925	37	0.101
38	1 25.094	1 34.951	1 44.807	1 54.664	2 4.520	2 14.377	2 24.233	2 34.090	38	0.104
39	1 25.259	1 35.115	1 44.971	1 54.828	2 4.684	2 14.541	2 24.397	2 34.254	39	0.107
40	1 25.423	1 35.279	1 45.136	1 54.992	2 4.849	2 14.705	2 24.562	2 34.418	40	0.110
41	1 25.587	1 35.444	1 45.300	1 55.156	2 5.013	2 14.869	2 24.726	2 34.582	41	0.112
42	1 25.751	1 35.608	1 45.464	1 55.321	2 5.177	2 15.034	2 24.890	2 34.747	42	0.115
43	1 25.916	1 35.772	1 45.629	1 55.485	2 5.342	2 15.198	2 25.054	2 34.911	43	0.118
44	1 26.080	1 35.936	1 45.793	1 55.649	2 5.506	2 15.362	2 25.219	2 35.075	44	0.120
45	1 26.244	1 36.101	1 45.957	1 55.814	2 5.670	2 15.527	2 25.383	2 35.239	45	0.123
46	1 26.408	1 36.265	1 46.121	1 55.978	2 5.834	2 15.691	2 25.547	2 35.404	46	0.126
47	1 26.573	1 36.429	1 46.286	1 56.142	2 5.999	2 15.855	2 25.712	2 35.568	47	0.129
48	1 26.737	1 36.593	1 46.450	1 56.306	2 6.163	2 16.019	2 25.876	2 35.732	48	0.131
49	1 26.901	1 36.758	1 46.614	1 56.471	2 6.327	2 16.184	2 26.040	2 35.897	49	0.134
50	1 27.066	1 36.922	1 46.778	1 56.635	2 6.491	2 16.348	2 26.204	2 36.061	50	0.137
51	1 27.230	1 37.086	1 46.943	1 56.799	2 6.656	2 16.512	2 26.369	2 36.225	51	0.140
52	1 27.394	1 37.251	1 47.107	1 56.964	2 6.820	2 16.676	2 26.533	2 36.389	52	0.142
53	1 27.558	1 37.415	1 47.271	1 57.128	2 6.984	2 16.841	2 26.697	2 36.554	53	0.145
54	1 27.723	1 37.579	1 47.436	1 57.292	2 7.149	2 17.005	2 26.861	2 36.718	54	0.148
55	1 27.887	1 37.743	1 47.600	1 57.456	2 7.313	2 17.169	2 27.026	2 36.882	55	0.151
56	1 28.051	1 37.908	1 47.764	1 57.621	2 7.477	2 17.334	2 27.190	2 37.047	56	0.153
57	1 28.215	1 38.072	1 47.928	1 57.785	2 7.641	2 17.498	2 27.354	2 37.211	57	0.156
58	1 28.380	1 38.236	1 48.093	1 57.949	2 7.806	2 17.662	2 27.519	2 37.375	58	0.159
59	1 28.544	1 38.400	1 48.257	1 58.113	2 7.970	2 17.826	2 27.683	2 37.539	59	0.162
Mean Solar.	$8^{\mathrm{h.}}$	$9^{\mathrm{h.}}$	$10^{\mathrm{h.}}$	$11^{\mathrm{h.}}$	$12^{\mathrm{h.}}$	$13^{\mathrm{h.}}$	$14^{\mathrm{h.}}$	$15^{\mathrm{h.}}$	For Seconds.	

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	$16^{h.}$	$17^{h.}$	$18^{h.}$	$19^{h.}$	$20^{h.}$	$21^{h.}$	$22^{h.}$	$23^{h.}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.704	2 47.560	2 57.417	3 7.273	3 17.129	3 26.986	3 36.842	3 46.699	0	0.000
1	2 37.868	2 47.724	2 57.581	3 7.437	3 17.294	3 27.150	3 37.007	3 46.863	1	0.003
2	2 38.032	2 47.889	2 57.745	3 7.602	3 17.458	3 27.315	3 37.171	3 47.027	2	0.005
3	2 38.196	2 48.053	2 57.909	3 7.766	3 17.622	3 27.479	3 37.335	3 47.192	3	0.008
4	2 38.361	2 48.217	2 58.074	3 7.930	3 17.787	3 27.643	3 37.500	3 47.356	4	0.011
5	2 38.525	2 48.381	2 58.238	3 8.094	3 17.951	3 27.807	3 37.664	3 47.520	5	0.014
6	2 38.689	2 48.546	2 58.402	3 8.259	3 18.115	3 27.972	3 37.828	3 47.685	6	0.016
7	2 38.854	2 48.710	2 58.566	3 8.423	3 18.279	3 28.136	3 37.992	3 47.849	7	0.019
8	2 39.018	2 48.874	2 58.731	3 8.587	3 18.444	3 28.300	3 38.157	3 48.013	8	0.022
9	2 39.182	2 49.039	2 58.895	3 8.751	3 18.608	3 28.464	3 38.321	3 48.177	9	0.025
10	2 39.346	2 49.203	2 59.059	3 8.916	3 18.772	3 28.629	3 38.485	3 48.342	10	0.027
11	2 39.511	2 49.367	2 59.224	3 9.080	3 18.937	3 28.793	3 38.649	3 48.506	11	0.030
12	2 39.675	2 49.531	2 59.388	3 9.244	3 19.101	3 28.957	3 38.814	3 48.670	12	0.033
13	2 39.839	2 49.696	2 59.552	3 9.409	3 19.265	3 29.122	3 38.978	3 48.834	13	0.036
14	2 40.003	2 49.860	2 59.716	3 9.573	3 19.429	3 29.286	3 39.142	3 48.999	14	0.038
15	2 40.168	2 50.024	2 59.881	3 9.737	3 19.594	3 29.450	3 39.307	3 49.163	15	0.041
16	2 40.332	2 50.188	3 0.045	3 9.901	3 19.758	3 29.614	3 39.471	3 49.327	16	0.044
17	2 40.496	2 50.353	3 0.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	17	0.047
18	2 40.661	2 50.517	3 0.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	18	0.049
19	2 40.825	2 50.681	3 0.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	19	0.052
20	2 40.989	2 50.846	3 0.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	20	0.055
21	2 41.153	2 51.010	3 0.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	21	0.057
22	2 41.318	2 51.174	3 1.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	22	0.060
23	2 41.482	2 51.338	3 1.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	23	0.063
24	2 41.646	2 51.503	3 1.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	24	0.066
25	2 41.810	2 51.667	3 1.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25	0.068
26	2 41.975	2 51.831	3 1.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	26	0.071
27	2 42.139	2 51.995	3 1.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	27	0.074
28	2 42.303	2 52.160	3 2.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	28	0.077
29	2 42.468	2 52.324	3 2.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	29	0.079
30	2 42.632	2 52.488	3 2.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30	0.082
31	2 42.796	2 52.653	3 2.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	31	0.085
32	2 42.960	2 52.817	3 2.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	32	0.088
33	2 43.125	2 52.981	3 2.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	33	0.090
34	2 43.289	2 53.145	3 3.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	34	0.093
35	2 43.453	2 53.310	3 3.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	35	0.096
36	2 43.617	2 53.474	3 3.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	36	0.099
37	2 43.782	2 53.638	3 3.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	37	0.101
38	2 43.946	2 53.803	3 3.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	38	0.104
39	2 44.110	2 53.967	3 3.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	39	0.107
40	2 44.275	2 54.131	3 3.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40	0.110
41	2 44.439	2 54.295	3 4.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	41	0.112
42	2 44.603	2 54.460	3 4.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	42	0.115
43	2 44.767	2 54.624	3 4.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	43	0.118
44	2 44.932	2 54.788	3 4.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	44	0.120
45	2 45.096	2 54.952	3 4.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45	0.123
46	2 45.260	2 55.117	3 4.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	46	0.126
47	2 45.425	2 55.281	3 5.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	47	0.129
48	2 45.589	2 55.445	3 5.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	48	0.131
49	2 45.753	2 55.610	3 5.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	49	0.134
50	2 45.917	2 55.774	3 5.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50	0.137
51	2 46.082	2 55.938	3 5.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	51	0.140
52	2 46.246	2 56.102	3 5.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	52	0.142
53	2 46.410	2 56.267	3 6.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	53	0.145
54	2 46.574	2 56.431	3 6.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	54	0.148
55	2 46.739	2 56.595	3 6.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55	0.151
56	2 46.903	2 56.759	3 6.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	56	0.153
57	2 47.067	2 56.924	3 6.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	57	0.156
58	2 47.232	2 57.088	3 6.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	58	0.159
59	2 47.396	2 57.252	3 7.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	59	0.162
Mean Solar.	$16^{h.}$	$17^{h.}$	$18^{h.}$	$19^{h.}$	$20^{h.}$	$21^{h.}$	$22^{h.}$	$23^{h.}$	For Seconds.	

TABLE IV.—LATITUDE BY POLARIS.

TABLE FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS.

Reduce the observed altitude of Polaris to the true altitude.

Reduce the recorded time of observation to local sidereal time.

If the sidereal time is
- less than 1h 17m.4, subtract it from 1h 17m.4;
- between 1h 17m.4 and 13h 17m.4, subtract 1h 17m.4 from it;
- greater than 13h 17m.4, subtract it from 25h 17m.4;

and the remainder is the hour-angle of Polaris.

With this hour-angle take out the correction from Table IV, and add it to or subtract it from the true altitude, according to its sign. The result is the latitude of the place.

Example.—1886, November 10, at 9h 29m 29s, P. M., mean solar time, in longitude 29° east of Greenwich, suppose the true altitude of Polaris to be 29° 29′: required the latitude of the place.

	h m s
Local astronomical mean time	9 29 29
Reduction from Table III, for 9h 29m 29s	+ 1 34
Greenwich sidereal time of mean noon, November 10, page 183 .	15 18 16
Reduction from Table III, for longitude (= 1h 56m east, or minus)	— 0 19
Sum (having regard to signs) is equal to local sidereal time .	0 49 00
	h m
	1 17.4
Subtract sidereal time	0 49.0
Remainder is equal to hour-angle of Polaris	0 28.4

	° ′
True altitude	+ 29 29.0
Correction from Table IV. . .	— 1 17.6
Latitude	+ 28 11.4

TABLE IV—1886.

Hour-Angle.	0h.		1h.		2h.		3h.		4h.		5h.	
m	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′
0	− 1 18.2	0.0	− 1 15.5	0.4	− 1 7.7	0.9	− 0 55.2	1.2	− 0 39.1	1.5	− 0 20.2	1.6
5	1 18.2	0.1	1 15.1	0.5	1 6.8	0.9	0 54.0	1.2	0 37.6	1.5	0 18.6	1.7
10	1 18.1	0.1	1 14.6	0.5	1 5.9	0.9	0 52.8	1.2	0 36.1	1.5	0 16.9	1.7
15	1 18.0	0.1	1 14.1	0.6	1 5.0	0.9	0 51.6	1.3	0 34.6	1.6	0 15.2	1.7
20	− 1 17.9	0.2	− 1 13.5	0.6	− 1 4.1	1.0	− 0 50.3	1.3	− 0 33.0	1.5	− 0 13.5	1.6
25	1 17.7	0.2	1 12.9	0.7	1 3.1	1.0	0 49.0	1.4	0 31.5	1.6	0 11.9	1.7
30	1 17.5	0.3	1 12.2	0.6	1 2.1	1.1	0 47.6	1.4	0 29.9	1.6	0 10.2	1.7
35	1 17.2	0.2	1 11.6	0.7	1 1.0	1.1	0 46.2	1.4	0 28.3	1.6	0 8.5	1.7
40	− 1 17.0	0.3	− 1 10.9	0.8	− 0 59.9	1.1	− 0 44.8	1.4	− 0 26.7	1.6	− 0 6.8	1.7
45	1 16.7	0.4	1 10.1	0.7	0 58.8	1.2	0 43.4	1.4	0 25.1	1.6	0 5.1	1.7
50	1 16.3	0.4	1 9.4	0.8	0 57.6	1.2	0 42.0	1.4	0 23.5	1.6	0 3.4	1.7
55	1 15.9	0.4	1 8.6	0.9	0 56.4	1.2	0 40.6	1.5	0 21.9	1.7	− 0 1.7	1.7
60	− 1 15.5		− 1 7.7		− 0 55.2		− 0 39.1		− 0 20.2		+ 0 0.01	

Hour-Angle.	6h.		7h.		8h.		9h.		10h.		11h.	
m	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′
0	+ 0 0.01	1.7	+ 0 20.2	1.7	+ 0 39.1	1.5	+ 0 55.3	1.2	+ 1 7.7	0.9	+ 1 15.5	0.4
5	0 1.7	1.7	0 21.9	1.6	0 40.6	1.4	0 56.5	1.2	1 8.6	0.8	1 15.9	0.4
10	0 3.4	1.7	0 23.5	1.7	0 42.0	1.5	0 57.7	1.1	1 9.4	0.7	1 16.3	0.4
15	0 5.1	1.7	0 25.2	1.6	0 43.5	1.4	0 58.8	1.1	1 10.1	0.8	1 16.7	0.3
20	+ 0 6.8	1.7	+ 0 26.8	1.6	+ 0 44.9	1.4	+ 0 59.9	1.1	+ 1 10.9	0.7	+ 1 17.0	0.2
25	0 8.5	1.7	0 28.4	1.6	0 46.3	1.3	1 1.0	1.1	1 11.6	0.6	1 17.2	0.3
30	0 10.2	1.7	0 30.0	1.5	0 47.6	1.4	1 2.1	1.0	1 12.2	0.7	1 17.5	0.2
35	0 11.9	1.7	0 31.5	1.5	0 49.0	1.3	1 3.1	1.0	1 12.9	0.6	1 17.7	0.2
40	+ 0 13.6	1.7	+ 0 33.0	1.6	+ 0 50.3	1.3	+ 1 4.1	0.9	+ 1 13.5	0.6	+ 1 17.9	0.1
45	0 15.3	1.6	0 34.6	1.5	0 51.6	1.2	1 5.0	0.9	1 14.1	0.5	1 18.0	0.1
50	0 16.9	1.7	0 36.1	1.5	0 52.8	1.3	1 5.9	0.9	1 14.6	0.5	1 18.1	0.1
55	0 18.6	1.6	0 37.6	1.5	0 54.1	1.2	1 6.8	0.9	1 15.1	0.4	1 18.2	0.0
60	+ 0 20.2		+ 0 39.1		+ 0 55.3		+ 1 7.7		+ 1 15.5		+ 1 18.2	

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